

AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

PERCIVAL SHELDON RIDSDALE, Editor

OCTOBER 1917 VOL. 23

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AMERICAN FORESTRY is published monthly by the American Forestry Association.

Subscription price without membership, three dollars per year; single copies, twenty-five cents.

Entered as second-class mail matter December 24, 1909, at the Post-office at Washington, under the Act of March 3, 1879
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G. H. FERGUSON,

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SALE OF TIMBER, WHITE MOUNTAIN APACHE INDIAN RESERVATION

SEALED BIDS, MARKED OUTSIDE "BID." White Mountain Apache Indian Reservation Timber and addressed to "The Commissioner of Indian Affairs, Washington, D. C." will be received until 12:00 o'clock noon, Eastern Time, Wednesday, October 24, 1917, for the purchase of timber upon about 68,000 acres within Townships 8 and 8½ North, Ranges 23, 24, 25 and 26, and Townships 9 North, Ranges 24 and 25 East, G. & S. B. P. M., Arizona. The sale embraces approximately 400,000,000 feet of timber (about 35% Western Yellow Pine and 3 to 5% Douglas Fir and other species). Each bid must state the amount per thousand feet, Scribner decimal C, log scale, that will be paid for timber of all species cut prior to October 1, 1924. Prices subsequent to that date are to be fixed by the Commissioner of Indian Affairs by three year periods, in accordance with operating and market conditions. No bid of less than Three Dollars per thousand feet for all species within the sale area for the first period will be considered. Each bid must be submitted in triplicate and be accompanied by a certified check on a solvent National Bank, in favor of the Superintendent of the Fort Apache Indian School, in the amount of Fifteen Thousand Dollars. The deposit will be returned if the bid is rejected, but ten per cent. of it will be retained if the bid is accepted and the required contract and bond are not executed and presented for approval within thirty days from such acceptance. If the bid is accepted and the contract and bond executed, the deposit will be applied as an advance payment on the purchase price. The right to reject any and all bids is reserved. For copies of bid and contract forms and for other information regarding the offering, application should be made to the Commissioner of Indian Affairs.

The Department of Agriculture has advertised a tract adjacent to the Indian Reservation containing approximately 235,000,000 feet of timber. The Indian timber and the National Forest Timber are being advertised at the same time with the understanding that the purchaser of these tracts may log them together. Information as to the National Forest Timber may be obtained from the District Forester, Albuquerque, New Mexico, Washington, D. C., August 27, 1917. **CATO SELLS,** Commissioner of Indian Affairs.

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AMERICAN FORESTRY

VOL. XXIII

OCTOBER 1917

NO. 286

A RELIEF AND COMFORT FUND

WITH the entry of the regiments of foresters, woodsmen and lumbermen into service in the European war zone there arises urgent need for providing definite relief for families of its members requiring assistance while they are on service, or if they are killed or wounded, and for affording field comforts for the men themselves. To meet both phases of this need the American Forestry Relief and Comfort Fund has been organized. Through the operation of this fund it is believed that much can be accomplished in behalf of the men and their dependent families.

That this enterprise will commend itself to the individual membership of the American Forestry Association is certain. Every man and woman interested in the woodland wealth of America will have a direct interest in the men who have gone into the forests of devastated France. A common love for the open places of the great out-of-doors cements the two classes into a brotherhood of sympathy and understanding. The members of the Tenth Engineers (Forest) are doing a work which appeals to all those to whom it has been given to know the message of the forest. They are doing this work in answer to the urgent call of their country and the vital needs of the allied nations joined with America in the fight for the perpetuation of Democratic institutions. Those of us who remain at home have no duty more imperative than to show them that their patriotism is appreciated and their sacrifices met with adequate response. To achieve this nothing will be so effective as to give them assurance that their loved-ones will not suffer and that their own welfare in the war-zone will be looked after by the people back home.

In sending the Tenth Engineers (Forest) to France the War Department has made only a beginning. Another regiment is now in process of formation and within a short time there will be 9200 men in these organizations in French territory. With the increased number will come increased needs. In order that adequate provision may be made for these needs it is important that the Relief and Comfort Fund shall make headway as rapidly as possible.

The primary purpose of the Fund will be to look to

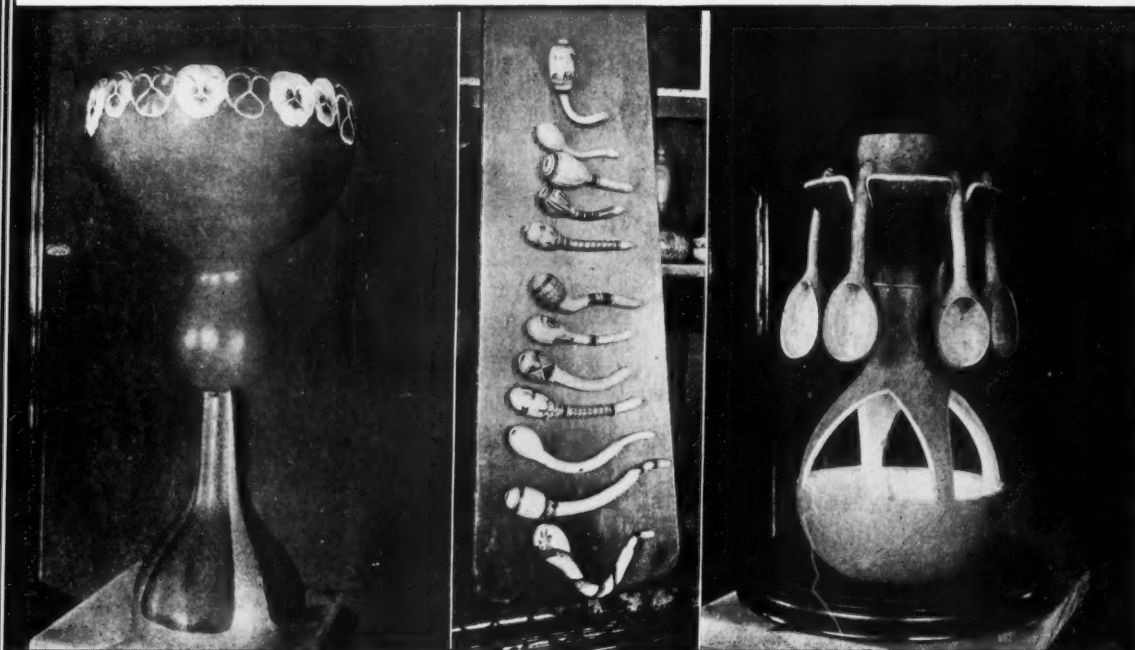
the needs of dependent families. Among the thousands who answer the country's call for forest workers it is inevitable that there should be some who are illy prepared to leave their families properly provided for. The pay of a soldier does not go very far toward meeting the requirements of a household left without its usual means of support. If there be illness or other misfortune the deficit is emphasized. With the haunting fear that his loved ones are not properly cared for the soldier forester will be sadly handicapped in his work. That he should labor under this handicap is manifestly unfair. The people of a grateful nation are under a patriotic obligation to remove this source of worry from the man who has gone to France to contribute his skill and to risk his life in the interests of the cause of freedom. The aim of the fund is to make provision for such dependent families, to assist the man and his household in the event of injury and to provide insurance money in the event of death. In making these things possible the generous people of America will be doing that which is not only a duty but a privilege as well.

The personal comfort and entertainment of the men in France will be another important consideration of the Fund. The man who undertakes the man-sized job of a woodsman needs all the comfort and relaxation he can find. This is true even when he is in his own woods in his own country. When he is taken from his native environment and transplanted to the battle-torn forests of an alien land, among the people of an alien tongue, his needs are vastly multiplied. He will want every form of comfort that can be provided. For relaxation and mental stimulus he will want books and periodicals from home. These things are especially important, as is attested by all army men who have had experience in field and camp. As a panacea for strained nerves and homesickness he will want his pipe and tobacco, through the medium of which to reap peace and contentment otherwise lacking. For his bodily comfort he will need sleeveless sweaters and mufflers with which to protect himself from the chill winds of the French winter. For his recreation he will need phonographs and records with which to beguile the hours of leisure that otherwise would hang heavily on his hands. For these things he will look to the American Forestry Relief and Comfort Fund.



WHAT A WELL-TRAINED GOURD VINE CAN DO WHEN IT TRIES

It is no longer considered necessary for a gourd to grow in the old-fashioned form, which made it chiefly useful as a dipper to accompany the old oaken bucket. A gourd enthusiast has taken the time to produce gourds of various shapes and in proof of his skill he submits this picture of his vineyard. One of his proudest achievements was the production of gourds that were so much like eggs in appearance as to cause visitors extreme consternation when the "eggs" were "accidentally" spilled.



NOT THE PRODUCT OF THE SILVERSMITH, BUT JUST GOURDS

Among the curious developments of the gourd in the vineyard of the enthusiast referred to above is the flower vase shown in the left-hand picture. In the center, mounted on a board, is a display of cigar holders, plucked fresh from this same vineyard. At the right is a bowl, with ladles. The grower of these remarkable gourds is E. E. Wilcox, a New York banker, and he insists that any gourd fancier can achieve the same results. The pictures were taken on the Wilcox farm.

WOOD ON THE WING

By BRISTOW ADAMS

6OMBS from a foreign airplane were employed in a bombardment of the White House on Saturday, September 22, 1917. That the bombs were floral and that the airplane carried the colors of a friendly nation are merely incidental. The important fact is that the bombardment took place and was witnessed by thousands of interested spectators.

On a brisk autumn morning an ivory-tinted airplane gleamed against the bluest sky that ever domed the City of Washington. The sky was essentially Italian, imported especially for the purpose of welcoming the ivory tinted biplane which had been piloted by an Italian flyer from Norfolk to the banks of the Potomac. Thousands of people awaited the arrival of the plane and greeted the visitor with the enthusiasm born of international brotherhood in arms. Hardly had the aviator received the cordial welcome of sky and populace when up from the horizon swept another and larger biplane, silver-gray, to be followed shortly afterwards by the great Italian war-tractor carrying a dozen or more persons.

It was during the flight over the city that the floral bombs were dropped on the Executive Mansion.

Less than ten years before a group of watchers had looked toward the same Southern horizon for the appearance of another biplane. This machine had passed the preliminary tests and was on its final supreme trial before acceptance by the United States Government. The supreme trial was an overland flight from the parade ground at Fort Myer, just across the Potomac from Washington, down to Alexandria—all of seven miles away—and back again to the starting place. As the wind died down with the setting sun, this Wright machine, started by means of the pulley-and-weight launching device, made a few preliminary circlings and then sailed away over the tree-tops out of sight to the South.

The wait for its return seemed interminable; watches were consulted; it had been gone ten minutes. "I'm afraid it won't get back!" said one; "probably couldn't make the turn," said another; "maybe he hit a tree—he was flying rather low." This was the tenor of the com-



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BUILDING AMERICA'S GREAT AIR FLEET FOR USE IN THE WAR

The extent to which wood enters into airplane construction is attracting the attention of foresters and lumbermen. The Government's program calls for the construction of 23,000 airplanes within twelve months. This call for 20,000,000 feet of lumber for propellers alone. For the aviation school cantonments the need is 120,000,000 feet and for coastal airplane stations 22,000,000 feet. This picture shows one of the processes in building the planes in a factory which is turning out large numbers for the Government. It illustrates the construction of the frame of a plane.

ments, with certain optimistic reassurances from others. Then the faint burr of propeller and engine electrified the group of watchers; faint and far a bird-like form showed above the trees, and then swept up fully into view. Was there ever such a thrill? There was no cheering; everybody was holding his breath!

In 1917 it was different. Airplanes were, comparatively speaking, quite common. Washington, between the parade ground at Fort Myer and the flying field at College Park, had become quite *blase* to flying machines gliding across the city at twilight. Then, too, the aerialists who exhibited their powers at fairs, had added to their repertoires the feat of circling the capitol dome and

looping-the-loop above the apex of the Washington Monument.

But these Italians had something new. They used large planes and did all of the exhibition stunts and a few others besides, including a heart-stopping sidewise fall that might fool even an enemy pilot into believing they had been mortally hit.

"Eyetalians pullin' dat stuff!" was the disparaging remark of a messenger boy who stopped to watch the performance, despite a half-dozen telegrams in his hat. "Don't tell me a bunch o' Wops is gettin' away wid dat box o' tricks. Dem's Americans; we're de only ones dat's got de goods in dat stuff." And he would not be per-

suaded otherwise. No sir-ree!

But there were the planes, heavier than air, larger than a freight car in outside dimensions, disporting themselves like playful swallows, and doing topsy-turvy tumbling that no sane swallow ever thought of undertaking. Structures of cloth, and wire and wood, supporting heavy engines and passengers, playing in the air with the easy, careless grace of fur-seals in the billows of the sea!

"And wood," says the recurrent and insistent thought of the forester, "is the essence of their construction." History, which does not go far back in this case, says the same thing. Here is the record.

During the years from about 1910 to 1915, the Forest Service made a series of studies of the wood-using industries of the United States, by States. These were made in co-operation with the States themselves, or with organizations within the State boundaries, and the results were published by the co-operating agency, or, in some instances by lumber trade journals.

These reports took up each wood-using industry in alphabetical order, discussed its needs and its value, gave the kinds of woods used and the sources of the raw material. The alphabetical lists usually began with "agricultural implements" or "automobiles," and ended with "umbrella



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AT WORK ON THE FRAME FOR A GOVERNMENT AIRPLANE

Great care and precision are required in the building of an airplane. If the plane is to be used in warfare this accuracy of construction involves not merely the life of the aviator, but the safety of an entire army may depend on it if the bird-man is engaged in directing the operations of the fighting forces below. This means that every step must be taken with the utmost skill and caution. The delicate construction is apparent.

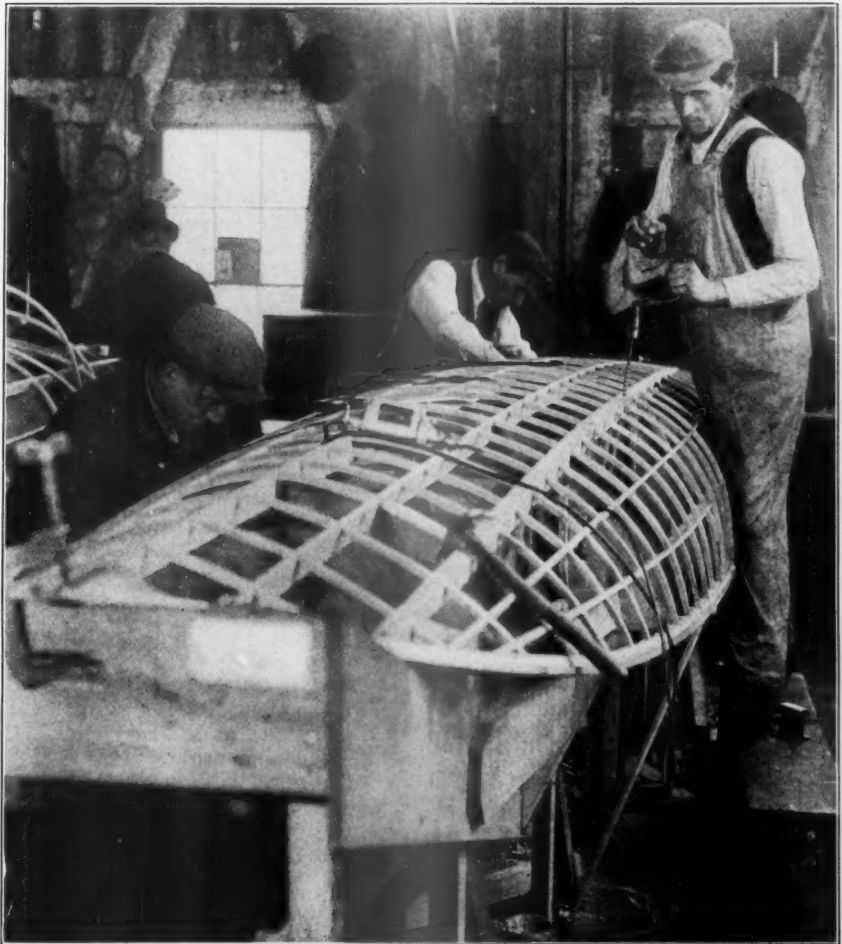
sticks," "vehicles" or "woodenware." In only one that the writer has seen—and he has made a pretty thorough search through them—has there been any mention of airplanes, yet wood is the essential material in their construction. In other words, airplane manufacture, upon which the outcome of the war is said to depend, was scarcely mentioned in this series of government reports issued within the past five years.

The one exception to the general dearth of facts about airplane manufacture was in the report on the wood-using industries of New York, issued in 1913. It listed three manufacturers who made planes or their parts, and gave the quantity of wood used annually as 31,400 board feet, of which spruce furnished about half, the other woods mentioned being ash, yellow poplar, white oak and hickory. The total cost of all woods used was less than \$1,000.00, to be exact, \$968.

Compare these figures of four years ago with the present plans for 7,500,000 feet of oak, and from 40,000,000 to 100,000,000 board feet of spruce.

It is difficult to state authoritatively just how much lumber is going into airplane construction, because authorities disagree. One statement which has official sanction is about as follows: "The war is going to be won in the air. The program calls for the construction of more than 20,000 airplanes within twelve months." Since then it has been stated that the estimates have been revised—and it has been a revision upwards. In another statement it is pointed out that "each propeller uses 300 feet of lumber, and if 23,000 airplanes are built as proposed, and two propellers are held in reserve for each machine, it will take 20,000,000 board feet for the propellers alone." This corresponds to the 7,500,000 feet of oak for the supplying of the blades actually needed for initial construction, without allowing for reserve propellers. The government now is using, according to another authority, some 3,500,000 feet of lumber for airplanes themselves, and 120,000,000 feet for aviation school cantonments with an additional 22,000,000 for coastal airplane stations.

Spruce stands first in the kinds of wood demanded in airplane construction. Practically all of the framework



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WOOD IN THE WING OF A WAR AIRPLANE

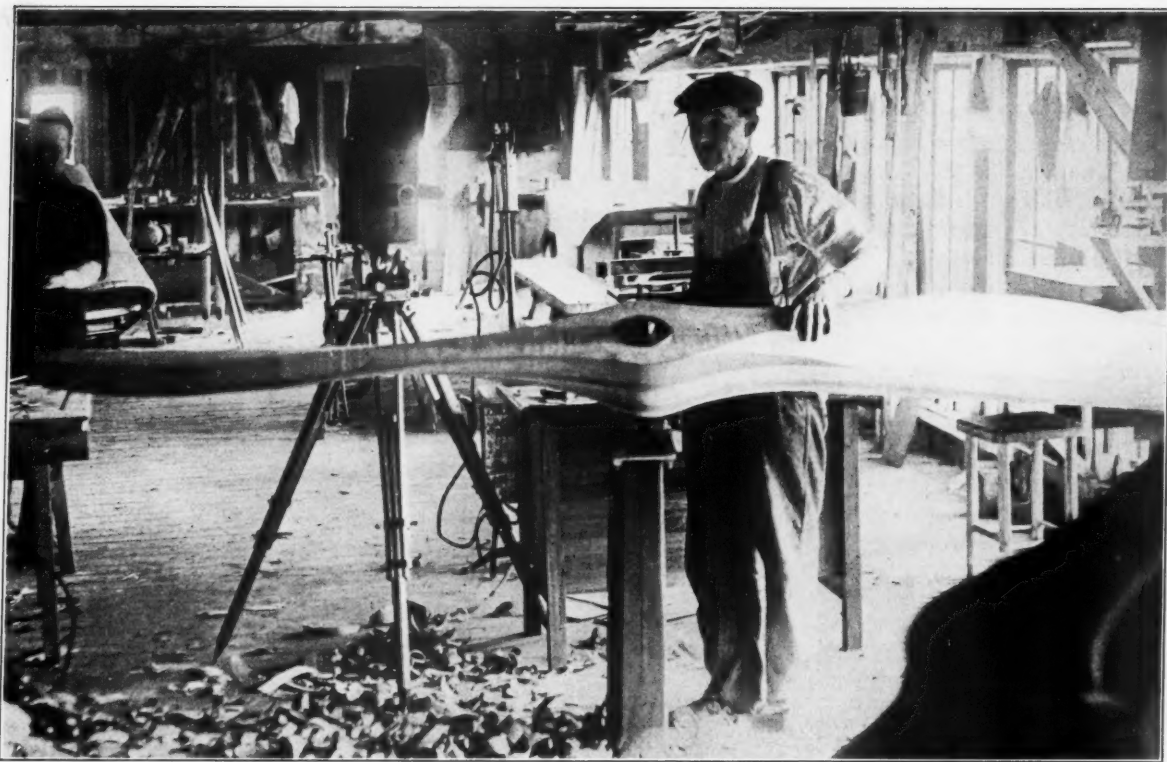
Spruce stands first in the kinds of wood demanded in airplane construction. Practically all of the construction is of built-up or laminated wood. One advantage of this construction is that the lamination divides the stresses and prevents them from coming in full force on any one grain. Another advantage is that the laminated stock can be built to form curves or can be bent to curves without splitting or weakening the piece. This picture shows men at work making a wing for a Government war plane.

is of spruce and it bids fair to hold its place, with a possible supplementing by bamboo. Metal tubing has been tried, but has not given satisfaction.

The essential qualities of airplane woods include straightness of grain, strength and lightness, and absolute freedom from defects. The "struts" or upright posts used in biplanes and triplanes are of spruce, as are the supporting ribs in the planes themselves, and the beams, running lengthwise. In these, in particular, the grain must be straight, and must continue the whole length of the piece without going across from one side to the other, or without "running out."

Practically all of the construction is of built-up or laminated wood, in which thin layers are glued together to form the part needed. That is, each post, beam, or rib is made up of thin strips glued together. Except for tacks used in covering the wing frames no nails are used, because they make weak spots where they are driven.

The laminated construction has many advantages. In the first place, the smaller the pieces of wood that are



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FASHIONING A PROPELLER FOR A WAR SHIP OF THE AIR.

The speed of a propeller's revolutions make heavy demands on their strength. Some idea of this strain is afforded by the statement that some engines run at 1700 revolutions a minute and can be geared up to 2000. An engine of this power would use a nine and one-half foot propeller and the speed of the blade ends would be approximately 600 miles an hour. Such speed subjects the blade to pressure of a good many thousand pounds to the square inch and propellers are apt to split at the center and fly apart unless made of perfect material and with great care.

used the more likely are they to be free from defects. Further, the lamination divides the stresses and prevents them from coming in full force on any one grain. It is, on the whole, another exemplification of the adage that in union there is strength. Still another advantage comes from the fact that the laminated stock can be built to form curves, or can be bent to a curve without splitting or weakening the piece. The planes are curved from front to back, and the ribs upon which they are stretched form the basis of this curve.

The main reason for the use of spruce is its uniformity of structure and freedom from defects. Other woods have desirable mechanical properties, but



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FEW NAILS ARE PERMITTED IN AIRPLANES

Nails are not a great deal used in the building of airplanes. Each post, beam or rib is made up of thin layers glued together. Nails weaken the structure. One part of the construction in which nails or tacks are used is in covering the wing frames, as pictured herewith. This must be done with the utmost care and requires the employment of men of skill and intelligence.

lack what might be termed the reliability of spruce. Upon the wood's reliability the safety of the aviator depends, and in turn this may mean the safety of a whole brigade of men on the ground, whose movements the aviator is directing. In other objects made of wood there can be a slight margin of material which is not quite perfect, and this is recognized in the lumber grading rules; but not so with airplanes.

Spruce has the quality of being what it appears to be on the surface. It does not have hidden defects, and this material frankness makes it a favorite. If one picks out a stick of spruce that looks good—is clear and straight—he may be sure that it is good. Other woods very



Photograph from Underwood & Underwood, New York.

WHERE PROPELLERS ARE BUILT IN LARGE QUANTITIES.

This is a picture taken in the propeller department of one of the great airplane plants now devoted to turning out machines for the United States Government. Ash has been preferred for this feature of construction, but the largest single order for propeller-blade material is said to have been for the finest grade of quarter-sawn white oak. Propellers are sometimes made of mahogany or of a combination of mahogany and spruce to alternate layers. Some propellers are made wholly of black walnut, which does not splinter when hit by a projectile. The sponginess of texture that keeps walnut from splintering is one of the chief reasons for the use of this material in rifle stocks.

like spruce in general appearance may look as straight and clear, but will occasionally deceive.

Propellers, like the other parts, are made of built-up pieces. Ash has been preferred; but the largest single order for propeller-blade material is said to have been for the very finest grade of quarter-sawn white oak. Some propellers are made of mahogany, mahogany and spruce in alternate layers, or mahogany and ash. Black walnut has been used in place of mahogany, and some propeller blades are made wholly of black walnut. This is partly because black walnut, hit by projectiles, does not splinter. It has a sponginess of texture which gives it this quality, and furnishes one of the reasons why black walnut is universally in demand for rifle stocks.

The propellers are subjected to other trials than those of gun fire, and their normal action makes heavy demands on their strength. The very speed of their revolutions tends to disrupt them. In a test run with propellers made of wood which had been dried to the lowest possible moisture content, or bone-dry, as they say at the Forest Products Laboratory, the ends of the blades actually exuded sap which was forced out by centrifugal action. In tests, at least, it has been possible to speed the propellers up to such a pitch that the outer end of the blade on an eight-foot propeller travels at the rate of 400 miles an hour.

Some air-machine engines run at 1700 revolutions a minute, and can be geared up to 2000. An engine of this power would use a nine-foot-six-inch propeller, and the speed of the blade ends would be in the neighborhood of 600 miles an hour. A good many thousands of pounds of pressure per square inch are generated by this action

alone, and propellers have been known to split at the center and fly apart. Even the smallest lack of balance between the two blades is very serious, since the pull of one must counterbalance that of the other.

In addition there is the gyroscopic force which tends to keep the blades rotating in the same plane. At high speed this force is hard to overcome, and the cross strains it introduces when there is a change of direction, either up, down, or sidewise, are enormous.

Yet under conditions of modern warfare, when an aviator has to "loop the loop" or plunge, or ascend sharply in maneuvering to bring down, or to escape from, an enemy the machine has to meet and withstand these unusual tests.

Ash is used somewhat in propeller blades, but serves its main purpose for engine beds; maple, birch and cherry have found some place in propeller manufacture; Douglas fir has been used for struts, and while there is a plentiful supply of this wood it does not have all of the required characteristics. Sugar pine has value, but the commercial output is not large enough to make it wholly dependable.

Already the demand for woods is forcing a search for substitutes in place of spruce; of these, Port Orford cedar appears to be the most promising. It is marketed from a comparatively small area in southern Oregon only, and sufficient quantities cannot be gotten out at once. Other substitutes for spruce are eastern white pine and southern white cedar, though it must be admitted that the latter has been suggested because of some of its known advantages and not from actual tests.

The best of the spruces for airplane manufacture is

the western variety, or Sitka spruce. There is more than enough of it, but there is difficulty in getting the very highest grades. The Forest Service estimates that only 13 per cent, approximately, is available for plane construction. Of Port Orford cedar, 10 per cent is about all that can be counted on as good enough for planes; about 8 per cent can be used from the spruce of Virginia and West Virginia, and only about 5 per cent from the smaller trees of Maine. A member of the Curtiss firm is reported to have said that only 167 board feet, on an average, goes into planes from each 1000 board feet; he further estimates that 117,000,000 feet of spruce is needed between now and next July.

The Italians, who have made some of the largest planes, have gone farther into the use of Douglas fir than have the other nations, claiming that it has enough of the required mechanical properties and that its greater weight is no bar in the heavy machines that they are building. Laboratory tests indicate, however, that it may lack somewhat in shock-resisting qualities. A recent contract, reported from Seattle, calls for 25,000,000 feet of Douglas fir for airplane use by Italy.

In the New York report of 1913 the average cost of the woods then used in plane manufacture was about \$30 a thousand board feet, which was high as compared with the costs of wood used in other industries, though some industries far exceeded this cost of raw material; black walnut for fire arms, woods used for sporting goods, and cigar-box woods were more expensive. Some

manufacturers reported special prices as high as \$100 a thousand, a cost exceeded only by the woods used for cigar boxes. At that time, with the smaller machines, the total cost of lumber in an airplane ranged between \$100 and \$150, while the labor cost was between \$800 and \$1000.

Since then, prices have increased enormously. It is said that construction experts of four nations—American, English, French and Italian—have agreed on a price of \$105 a thousand for the grades of Sitka spruce which they have specified as coming up to the excellence demanded. The quantity of wood needed for each plane varies, of course, with the size of the machine; few of the present-day types contain less than 250 feet, and it may take 2000 feet in the rough to furnish this amount. One Washington lumberman is making sure of getting only the straightest of straight-grained stuff by splitting it out of the log instead of sawing it. He gets quality at the expense of considerable waste, just as there has always been enormous waste in riving out choice white oak cooperage stock, or hickory for spokes. But the resultant product is sure to have straightness of grain. There is no place where this is more important than in planes.

There has been an actual dearth of the kind of Sitka spruce that must be had, but the northwestern loggers and mill men, in spite of labor troubles said to have been fomented by our enemies, have begun to catch up with the demand; before long they should be able to keep up



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WHERE FLYING IS LEARNED BY UNCLE SAM'S AVIATORS.

With the constant increase in the army aviation corps comes an increased demand for training school facilities. This picture shows carpenters at work on the construction of hangars for the storing of airplanes at one of the Government schools. Skilled aviators are being turned out rapidly at these camps, to man the thousands of airplanes now being built by the Government. Evidence that aviation is perhaps the most interesting branch of army service during the present war is given by the way the young men of the country are flocking to join the corps. Every camp in the country is being enlarged to take care of these future warriors of the air.

a sufficient and constant supply. In fact, they promise to do so.

The use of wood in airplanes constitutes a new field for this most necessary commodity. It would be surprising to the layman to see the work that is being done all over the country in perfecting this use. The best engineers of the country are busy designing, many of them being gathered in Washington with the Council of National Defense. There is a national advisory committee on aeronautics whose members are performing experiments and plotting curves all day long. Some are specialists on propellers, others on the structure of the planes, to say nothing of all the work that has been done

and as to workability or ease of manipulation in manufacture.

It is currently reported that those who have studied the possibilities of manufacture within the next year agree that Germany can almost keep pace with the combined output of England and of France. Numerically, there will be no marked supremacy in the air on the western front until the United States gets into the game and gives the Allied forces a distinct advantage. For the Allies to win the war, it is generally admitted that the German air forces must be literally smothered, thus putting out the eyes of the Teuton armies. In addition, the war which has long been practically a deadlock in



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SPEED IS SUGGESTED BY THE VERY LOOKS OF THESE BODIES

In this general scene in a manufacturing plant is shown a line-up of airplanes almost finished and ready for delivery to the Government. Each of the long slim bodies shows the seats for observer and pilot. In the lower left-hand corner are rudders painted with the red, white and blue stripes which are the emblem of identification for the American flyers. Each week sees this room emptied by the transfer of the bodies to the final assembling rooms. The factory in which this picture was made turns out scores of machines every month and within a short time the very planes here shown will doubtless be carrying American aviators over the fighting lines in France.

on engines. The research branch of the Forest Service has been busy in this field, and the timber tests conducted at the Forest Products Laboratory have been invaluable. Private firms have had their own experts investigating. If air supremacy does not come out of it, then American inventiveness and ingenuity have at last been stumped.

Back of all there is the insistent thought that the forest resources of the country, serving so well in war in addition to their basic value in peace, are worthy of every effort that can be made to conserve them. They furnish in the case of airplanes, a material for which there is no substitute as to strength in proportion to lightness,

the trenches, must be carried into Germany by the air route, with destruction showered from the skies, ten times as far inland as the range of the biggest guns, upon the great war works at Essen and upon the fleet at Kiel. This is to be an important phase of America's helpfulness in winning the war.

The editorial staff of AMERICAN FORESTRY has made contribution to the aviation corps of the United States Army through the enlistment of Mr. C. W. H. Douglass. With commendable patriotism Mr. Douglass made no attempt to exert the influence at his command toward procuring a commission. He was content to go as an enlisted man and is now with the army in European territory.

C. H. SHATTUCK has left the University of Idaho to become professor of forestry in the University of California. He will pay especial attention to developing the department of grazing and announces a class of 23 students in this subject.

FORESTRY students of the University of Missouri, Department of Agriculture who belong to the Tenth Engineers, Forest Regiment, are C. R. Fritchle and E. B. Hotze, of St. Louis; F. G. Kraft, of Kennett, Missouri, and G. A. Calloway, of Lafayette, Missouri.

FLYING WEDGE OF BANKERS AND FARMERS

An Address Before the American Bankers' Association at Atlantic City, September 24, 1917, by Charles Lathrop Pack, President of the American Forestry Association and the National Emergency Food Garden Commission.



FOOD CONSERVATION is as important and vital as food production. In the work of the National Emergency Food Garden Commission, our Washington offices have concentrated their efforts for the last three months on a nation-wide drive for winter preparedness. We have conducted a campaign of education intended to reach every town and city home in America. How well this has succeeded is shown by the circumstance that our manuals on home canning, home drying, home storage and home pickling of vegetables and fruits have been circulated by millions of copies, in every part of every state in the Union. The daily lessons and helpful hints prepared by our experts on food conservation have been published constantly in nearly two thousand newspapers throughout the country. As a result the Commission feels that the homes of America are acquiring familiarity with the subject of food conservation hitherto unknown, and this familiarity has brought about an unprecedented activity in preparing foodstuffs for winter uses.

This brings us, naturally, to the general question of eliminating the middleman as far as may be possible. The town people who have been gardening and who have been storing away food in their cellars and on their pantry shelves have been striking a telling blow at the prices that have made the cost of living so prohibitive. An economist tells us that the price of garden vegetables has risen only about twenty-two per cent the past year, while the increase in grain and some other products has been several times as great.

Let the bankers and the farmers of America now unite in a flying wedge against the middleman and the food problem will be near solution. The farmer is the best friend the country has, and the more thoroughly we show recognition of this fact the better off we will be. If he is prosperous you bankers and all the rest of us are prosperous. The thing for you to do, for us to do, is to get together—bankers and farmers—and smash the cornerstone of high prices. The man who is carrying the ball in this great home game of supplying food is the town and city farmer, who, as a result of the country-wide campaign of the National Emergency Food Garden Commission and the work of the Department of Agriculture, has planted three million food gardens during the current year—most of them where none were planted before.

The town and city farmer has not merely produced three hundred and fifty million dollars' worth of food F. O. B. the kitchen door. In the football game of food he has tackled Mr. Middleman, thrown him for a loss, and is driving him back from the goal of high prices. Now, with a flying wedge of banker and farmer as a

further help, a touchdown for conservation is certain. Your part, Mr. Banker, is to work with even greater zeal with the farmer. Aid him over the rough spots, so that next year he can produce more foodstuffs than ever before.

We must all wake up to the fact that this country is at war. No one knows when the end will be. This is not a parlor game, nor the annual maneuvers. It is war. If Sherman lived today, he would probably say that war is—supplies. Secretary Baker says that we will have two million five hundred thousand men under arms by spring. Uncle Sam's board bill for his soldiers and sailors will very soon be one million dollars a day. What are you doing—going to do—towards keeping those men fed, that the world may be made safe for Democracy?

Let me give you a quick picture of the food problem as I see it. At breakfast in New York I noticed on the bill-of-fare: "Cantaloupe, half portion, fifty cents." In my morning paper I read what the newspaper boys call a "Page One Freak," which told that a newspaper in Denver was giving away free, with every want advertisement placed in its Sunday edition, a cantaloupe of one of the most famous brands. There you have it. Half cantaloupes fifty cents in New York City, and whole ones nothing in Denver. The metropolis is far from the source of supply. Denver is its center. That tells the whole story.

You do not now have to be told again the need of food F. O. B. the kitchen door. The town and city gardener who can raise even half his winter supply of vegetables is able, as a result, to accomplish much as a constructive citizen, to leave his savings account untouched and to add to it. He can buy a Liberty Bond and he can keep his children in school instead of at work. In other words, we must make a big drive to produce food as near the point of consumption as possible, rout the excessive profits of the middleman, and help the railroads in the tremendous transportation problem that confronts them while the country is at war.

Glass jars and other containers for food must be conserved this winter and their manufacturers must next year be prepared to meet the largest demand for them the country has ever seen. From every section of the United States and Canada comes report that the production of vegetables and fruits suitable for canning will next year far exceed the high-water mark of this year. If twenty-five per cent of war gardeners failed, owing to inexperience, to get a good crop this year, not ten per cent will fail next year. People who did not plant this year have been so impressed with the nation-wide success

of the home-gardening and home-canning movement, that they will not be doing their duty to themselves or to their country if they do not do their share in 1918—and they will do it.

The food problem is one of the vital issues of today. It is a problem from which none of us may escape. Each of us has his individual responsibility in the situation. To win the final victory in the great war, America must feed not only herself and her fighting forces, but she must help to feed the people of England, France, Italy and Russia. To do this with the highest measure of efficiency is the real problem. There must be no lost motion. Every move must be made to count. Every act must be a blow for liberty in our work for Democracy to save and redeem civilization. It is not enough that we should all be alert to the food needs of America and

her Allies; we must back that alertness with constructive skill and real industry.

The necessity for all this is well expressed by Lord Rhondda, the English Food Administrator. He said last week, "I hope the exportable surplus of American primary foodstuffs will be much larger than the present estimates, as the result of food economics by which the United States and Canadian homes are helping to win the war, just as surely as in the production of munitions. Every American woman is in a position to bring nearer the inevitable atonement for the brutal outrages in Belgium, Armenia and Serbia—the sinking of the Lusitania and other horrors, by her day-by-day economies. There need be no fear that the sacrifices will be wasted over here. Unless the Entente Allies are able to import the supplies necessary for the army and the populations, victory may slip from our united grasp."

FIRST APPLE TREE OF THE NORTHWEST

By H. E. Zimmerman

In the Vancouver Barracks, State of Washington, there stands an apple tree of more than ordinary interest. Its history is very interesting and Bancroft, the noted historian, tells the following little incident in regard to it: "At a lunch party in London, about 1825, given in honor of some young gentlemen who were about to embark for Fort Vancouver, in the employ of the Hudson Bay Company, seeds of the fruit eaten were slyly slipped by some young ladies into the waistcoat pockets of the young men, and upon their arrival at their destination the young men, in overhauling their wardrobes, discovered the seeds and gave them to Bruce, the gardener at the fort." Mrs. Mary Whitman, wife of Marcus Whitman, also wrote an interesting history of this tree, September 12, 1836.

It is said that the seeds planted by the gardener, Bruce, produced several trees, three of which lived for a long time, and were pointed out as the only apple trees in the northwest. In the course of time two of them disappeared, leaving the present tree alone. Even the existence of this tree seems to have been almost entirely forgotten by the general public, not even the commander of the Barracks knowing that such a tree stood on the very ground which he controlled. It was largely through the horticultural inspector of this district, Mr. A. A. Quarnberg, that the tree was discovered and identified. In 1911 Mr. Quarnberg wished to have a gavel made of wood from this apple tree for the Washington State Horticultural Society, and, upon examining the same, found it badly infected with San Jose scale, half its branches dead, and in a bad condition generally. On January 13th that year he called upon Col. G. K. McGunnigle, Commander of the Barracks, and got the necessary permit to prune, spray and do anything necessary to preserve the life of the tree. On January 25th, by direction of the Washington State Commissioner of Horticulture, he took measurements—the same year—and found the tree to have the following dimensions: One



A TREE WITH AN INTERESTING HISTORY

It is an apple tree and stands in the Vancouver Barracks in Washington, the sole survivor of several planted about 1825, the seeds having been brought from London.

foot from the ground, 1½ feet in diameter; height, 33 feet, and spread of crown, 33 feet. On February 20-21, this year, the tree was pruned, and all dead branches and brush removed, the rotten wood in the trunk and branches cleaned out and filled with plaster-paris and cement, and all cuts painted. Later it was sprayed and a good coat of manure applied at its roots.

In 1915 the Department of Agriculture at Washington requested Mr. Quarnberg to send them specimen apples for making wax forms.

THE FRIAR, HIS DOG AND THE IRON CROSS

By ALICE SPENCER

WHEN science tackles some of the problems of wood structure the freaks of nature not infrequently have the best of the argument. One of the most difficult things for the scientist to determine is the cause of such peculiarities as are shown in the accompanying illustrations. These freaks are shown with photographic accuracy and have not been retouched or altered in any way.

In the first picture is shown a formation found in a poplar board at a Cincinnati upholstery furniture factory. The friar here represented in speaking likeness is considered one of the most interesting freaks of wood structure ever discovered. In the second picture is shown a curiously wrought animal face which might be taken for that of a dog or a hog. For the purpose of classification in a family group it is here chosen to designate it as the Friar's dog. This formation was found in a board cut from a new species of dogwood which was



THE HOODED FRIAR

This freak formation was found in a poplar board and shows the extent to which nature will go in varying the monotony of everyday tree growing.

ing. During its years of growth the tree apparently healed the outer scar by supplying a new covering of bark. This gave the exterior a normal appearance, but left the iron cross in the center for discovery when the trunk should reach a sawmill.

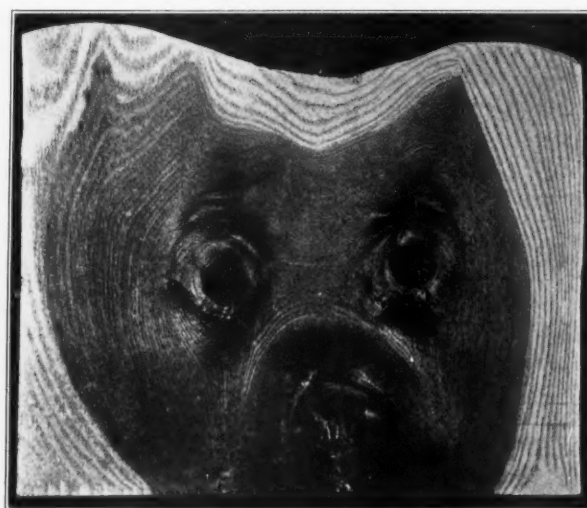


THE IRON CROSS

Perhaps the suspicious will think the discovery of this freak structure indicates that German spies are endeavoring to force American forests to supply iron crosses for military decorations. The suspicion is groundless.

recently discovered by Secretary R. S. Kellogg, of the National Lumber Manufacturers' Association.

The singular wood structure shown in the third picture comes from Greenfield, Ohio, and has been the subject of considerable speculation among scientists to whom it has been submitted. The exact cause of the formation has not been determined, but the best opinion seems to be that it resulted from the stripping of the bark of the young tree on four sides. The removal of the bark is supposed to have caused a discoloration which ultimately reached to the very center of the growing trunk, while those portions of the tree where the bark had not been damaged retained their natural color-



THE FRIAR'S DOG

Those who think this animal looks as much like a hog as a dog must remember that the board in which the picture was found was a piece of dogwood. This circumstance should settle all disputes.

SOME ACHIEVEMENTS IN FOOD

BY NORMAN C. McLOUD

BACKWARD look at the growing season of 1917 cannot fail to make one proud that he is an American. Throughout the nation the call to the flag of food production and food conservation met with response genuine and swift. The whole country organized itself into an army of soldiers of the soil and

age has been foiled and famine has been forced to surrender.

The close of the season is a time for stock taking in connection with the food situation. We have had production past all previous records and beyond all expectation. A nation-wide survey undertaken by the National



"THE BIGGEST WAR GARDEN IN THE WEST."

One of the most impressive results of the campaign conducted by the National Emergency Food Garden Commission was the war garden at Inspiration, Arizona. This garden was 3,300 feet above sea level, in the heart of the copper mining district. It covered an area of 217 acres and the double crop system was used to increase the fruitfulness of the land. The needs of the community were considered in planting and 85 per cent of the ground was used for raising Mexican pink beans and sweet corn. Nothing was allowed to go to waste and the Commission's manuals were freely used in encouraging canning and drying activities.

warriors against waste. In the creation of this army no draft was required. Confronted with threatened national food shortage the people of the United States acted with singular spontaneity. Enlistments were voluntary and enthusiastic. Service was energetic and constant. During the early months the symbols of service were the rake and the hoe. With the maturity of the crops these were supplanted by the canner and drier as tokens of the patriotic gift of the people to America at war. Through the combined attacks of the allied forces of producers and preservers food short-

EPIGRAMS ON HOME GARDENING AND FOOD THRIFT

From Literature of the National Emergency Food Garden Commission—Season of 1917.

Provide a Food Supply F. O. B. the Kitchen Door.
Winter Food Supply F. O. B. the Pantry Shelf.
Soldiers of the Soil; Warriors Against Waste.
Every Soldier of the Soil Should Promote Himself to a Colonel of Conservation.
In Its Power Against the Enemy the Can Is as Certain as the Cannon; the Drier as Dauntless as the Dreadnaught.
Can All Food That Can Be Canned.
The Nation Is Fired With the Spirit of a New Freedom.
Food Waste Is the Enemy, Food Thrift the Battle-cry and Food Conservation the Weapon.
War's Emergency Has Brought With It a Sense of War's Responsibility.
In Wartime a Nation With a Food Shortage Is a Nation in Peril.
It Is Time to Begin Starving the American Garbage Pail.
Otherwise We Will Begin Starving Our Allies in Europe.
Instead of Empty Tomato Cans the Backyard Now Has Its Crop of Tomatoes. For Unnumbered Tins We Have Substituted Foodstuffs in Unmeasured Tons.
Make Food Thrift Your Wartime Gift.

Emergency Food Garden Commission has located over three million home gardens, most of which were cultivated where no planting had been done before. On this vast area has been raised a food crop valued at \$350,000,000 — equivalent to \$350 of nourishment for each man of the million now under arms in the military and naval establishments of the United States. For this tremendous achievement of production too much credit cannot be given the Food Garden Commission which has worked in affiliation with the Conservation Department of the American Forestry Association.

Through its aggressive and forceful campaign of stimulation America has been thoroughly roused to the need for increasing the food supply as a measure of wartime preparedness. In the same way and by the same methods the people have been inspired to food conservation on a scale never before approached. As a direct result there was never a season that brought to the tables of America such a wealth of health-giving vegetation F. O. B. the kitchen door and never a winter which faced such abundant stores of home-grown and home-prepared food supplies F. O. B. the pantry shelf.

The first duty of this enormous yield of garden stuff, already accomplished, was its tremendous value in keeping down the cost of summer living for the people of America. That household expenses have been bad enough is painfully obvious. That they would have been far worse without this garden crop is equally apparent. Students of economics agree that if the war gardens had not created this increased supply, prices for vegetable products would have been a great deal higher. The average increase in prices for garden stuff has been little more than 20 per cent while the increase in the cost of grain products has been several times as great. This may well be taken as direct evidence of the worth of the home garden movement to the people of the United States.

The significance of this newly discovered planting area does not end with the summer season. The war gardens will exert their influence on the cost of living during the winter months just ahead. Their value is a thing of the future as well as the past. Conservation has been practiced on a national scale. In the homes of America there has been definite recognition of the importance of looking ahead. The individual citizen has realized that the over-supply of the growing season must be translated into terms of abundance for the winter. Food saving and food conserving have been practiced on a national scale. From a wasteful nation America has been remade into a nation alert to the needs of the future. The keynote of this new national spirit has been that nothing should be allowed to go to waste—that nothing useful should be thrown away. How well this spirit has crystallized into

action is shown by the plaintive cry of the garbage collectors throughout the United States. The men who make a business of converting waste into tangible assets are agreed that the new cult of Food Thrift is playing havoc with their profits. I know of one collector who complains that although he covers twice as much territory as he covered a year ago his collections are actually smaller. As a tribute to the American spirit of Food Thrift nothing could be more eloquent.

Of similar importance is the thrift shown by the people of America in achieving winter preparedness. Canning, drying and storage operations have filled cellars,

storerooms and pantry shelves with a tremendous supply of foodstuffs for winter use. It is a conservative estimate that close to half a billion jars of vegetables and fruits have been stowed away as a result of the season's canning operations. To this must be added the stuff prepared by drying, pickling, fermentation and other forms of conservation, and millions of bushels of vegetables stored in their natural state. The whole forms a national asset of tremendous volume.

In bringing about this great movement for production and conservation the National Emergency Food Garden Commission's offices in Washington have been a center of activity second to none of the wartime agencies at the seat of government. The commission's staff of experts and large office force have worked under emergency pressure during the entire season. The manuals prepared and issued

by the organization have been accepted as a notable contribution to the literature of food production and food conservation. Free distribution of the books on home gardening, home canning, home drying, home pickling and home storage has been made to the extent of millions of copies. The aim of the Commission was to place this literature in every home in America. That this aim has been approximated by results is apparent to those in touch with the situation. No channel of distribution has been overlooked. The manuals have been sent through agencies of federal, state, county and city governments, through school officials, through libraries, through councils of defense, through women's clubs and



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WINNER OF CANNING PRIZE NO. 1

As a stimulus to home canning the National Emergency Food Garden Commission offered one thousand prizes of \$5 each for home canned vegetables from war-gardens. Miss Helen Tew, of Washington, D. C., was the first winner, receiving check No. 1 and a certificate of merit.

through every conceivable avenue for reaching the people. In addition to this wholesale distribution the Commission has filled individual orders averaging 25,000 a day, received as a result of a persistent campaign of publicity in 2000 newspapers in the United States. The aggregate has been staggering, and the demand has taxed the capacity of the largest printing offices in Washington, Baltimore and Philadelphia.

Early in the campaign for canning and drying it developed that the government could not meet the demand for literature on these two subjects. Because of the war emergency the pressure on the government printing office was so heavily increased that there was unavoidable delay in printing for all branches of the public service. In one of the bulletins issued by the Commission it was stated that its Washington offices had received numerous calls from Congressmen asking for help. "One Congressman wanted 30,000 of our manuals," said this bulletin, "because he was swamped with requests and the government printing office, he said, could not fill the demand because of great tax upon it from all departments."

Through all of this activity the serious purpose of the Commission has been given frequent touches of relief by episodes incidental to the day's work. One of the most startling incidents of the campaign was the receipt of a telegram requesting that canning and drying manuals be

NO CAMOUFLAGE OF FOOD

While conceding the value of camouflage for the purpose of deceiving the enemy the National Emergency Food Garden Commission has taken a firm stand against trying to practice camouflage on the human stomach. "You may fool the enemy by masking your batteries and making the battlefield look like a peaceful landscape," says a recent bulletin; "but the stomach of a soldier is not so easily hoodwinked. The soldier must have real food."

sent immediately to Inspiration, Ariz., for use in connection with "the biggest war garden in the West." The Commission's staff includes people from all over the United States, but none had ever heard of Inspiration outside the fields of poetry and the arts. As a

town it had no meaning for any of the staff. Nor could it be located through consultation of maps or postal guides. It was not until inquiry had been made at the Postoffice Department that Inspiration was found, and even then it was learned that the place had to depend on a town two miles away for its mail facilities.

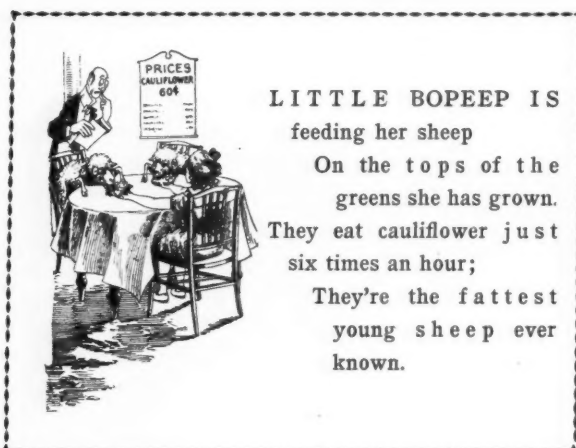
This was a puzzle. That a community which did not even boast a postoffice of its own should claim the biggest war garden, created a new situation and one not lacking in dramatic value. The manuals were forwarded by express without delay and the Commission then set in motion machinery for procuring further information about the big garden in the hidden community of the Southwest. The results were amazing—not to say an inspiration. From J. R. Sandige, the expert in charge, came the following statement of fact:

"The gardens are two miles east of Miami, Gila county, Arizona, at an elevation of 3,300 feet. The climate is semi-tropical, making it possible to grow some vegetables throughout the year. A majority of the gardeners are employees of the Inspiration Consolidated Copper Company, but quite a number of residents of

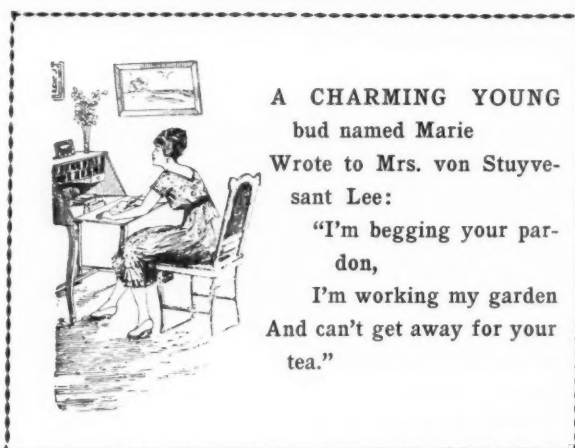


WHERE RACE MEETS RACE IN GARDEN WORK.

Not the least impressive feature of the war garden enterprise at Inspiration, Arizona, was the polyglot character of the workers. Perhaps no other garden in the country was cultivated in as many different languages. The picture gives a comprehensive idea of the diversity of races. Reading from left to right the men represented the following named races or nationalities: Apache Indian, Negro, Hungarian, English, Mexican, Irish, Chilean, Italian, American and Austrian. The gardeners in this big garden were for the most part employees of the Inspiration Consolidated Copper Company and the members of their families.



LITTLE BOPEEP IS
feeding her sheep
On the tops of the
greens she has grown.
They eat cauliflower just
six times an hour;
They're the fattest
young sheep ever
known.



A CHARMING YOUNG
bud named Marie
Wrote to Mrs. von Stuyve-
sant Lee:
"I'm begging your par-
don,
I'm working my garden
And can't get away for your
tea."

Miami and a large number of children have been given space. The gardeners are made up of many nationalities, including Italians, Mexicans, Indians, Chileans, Germans, Finlanders and Swedes. Over seventy per cent have never had experience in this work, or at least where it is necessary to irrigate, and they had to be taught.

"The gardens were planned by C. E. Mills, general manager of the company. An expert makes three trips a day over the gardens to instruct the gardeners. Bulletins and posters are placed at convenient spots in the gardens which are 217 acres in area. The double crop system was used. For example, squash were planted among corn so that when corn came off squash covered the ground. We grew most anything but need was considered first and 85 per cent of the ground was planted to Mexican pink beans and sweet corn. Nothing goes to waste and drying and canning is encouraged, especially drying, for our climate permits sun drying.

"We have opened a war garden market where the excess vegetables are sold for the gardeners, without cost to them. Nothing is sold at this market except that which is grown in the war garden. This market, I believe, is the first of its kind in the United States. This is the largest single tract of land devoted to war gardens in the west. With 217 acres under cultivation I believe it is the largest in the country."

Another high spot in the season's activities was the

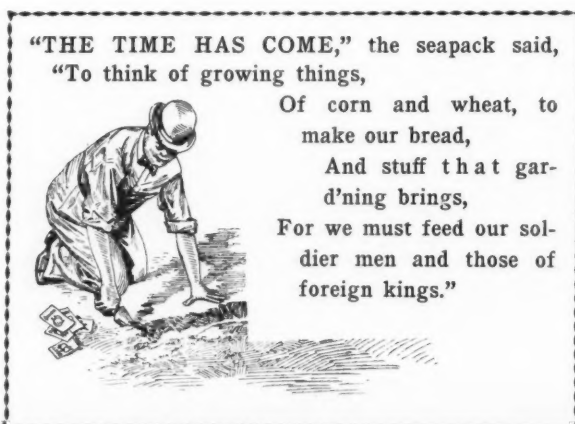
word which reached the Commission from Laurel, Mississippi. In this southern community practical application was given of the most efficient and reliable methods of conservation and thrift. Some of the moves were the substitution of motor trucks for horses for the sake of saving horse feed and the cutting of wood as a blow to over-reaching coal men. In a letter to the Commission Mayor T. G. McCallum wrote:

"Immediately upon the entrance of the United States into the war and the Government's appeal to the people to conserve and produce all products we proceeded at once to motorize all departments where motor trucks could be substituted for horses and disposed of the horses to farmers to produce more food as well as to save food by the introduction of the automobile. The next step taken by us was to secure and plant sufficient lands to corn and peas in order to produce enough corn and hay to take care of all the remaining city teams, and while we scarcely had time to do this, war having been declared late in the spring, we are glad to say that the city will make all the corn and pea-vine hay necessary to care for the teams owned and used by the city in the public work.

"As soon as this matter was out of the way we took up the question of fuel for the city schools, city hall, jail and other public buildings, and upon inquiry of the mines or coal dealers, many of them refused to quote us prices on account of the scarcity of cars, and with those



IF OLD Mother Hubbard
should go to the cup-
board
She'd find all the food
she'd desire;
For stored away there is
foodstuff to spare,
The product of canner
and dryer.



"THE TIME HAS COME," the seapack said,
"To think of growing things,
Of corn and wheat, to
make our bread,
And stuff that gar-
d'ning brings,
For we must feed our sol-
dier men and those of
foreign kings."

that did, the prices were from 50 per cent to 75 per cent higher than we had formerly paid for similar coal. So we proceeded to cut our own wood and while we are not quite through with the wood cutting proposition we are far enough along with it to know that we will, without great inconvenience, be able to secure all the wood needed for city schools and the city generally and at the same time effect a great saving in the revenue of the city.

From Elyria, Ohio, came tidings that Mrs. Thomas Edwards was believed to be the oldest woman in the United States to raise a war garden. Mrs. Edwards is 94 years of age and her garden was planted and culti-

Through the bureau of education the campaign was carried into the public schools of the nation. In co-operation with School Commissioner P. P. Claxton the Commission sent about 25,000 copies of its manuals on canning and drying to superintendents of public schools and co-operating with Commissioner Cato Sells, of the Indian Office, thousands of copies of its manuals were sent to the Indian schools in various parts of the country. It was felt that a great deal could be accomplished with the aid of the school children just as hundreds of thousands of vegetable gardens had been planted by pupils early in the spring. The bulletins on canning and



PART OF THE INSPIRATION OF INSPIRATION, ARIZONA.

If the gardening season of 1917 has left any person unconvinced of the value of child labor in war gardens the skeptic would do well to make a trip of exploration to Inspiration. The advantage of child labor of this type is that it is as valuable to health as to the cause of food production. Those who think to the contrary are cordially invited to submit pictures showing a healthier band of young people than here shown. Every boy and girl shown in the group worked in the biggest war garden in the West and their rugged health is as eloquent as the pictured crops as to the value of garden work.

vated entirely by herself. Early last spring she sent for the food garden primer issued by the Commission and carefully followed instructions given in this complete manual. Her success attracted national attention.

At East Orange, New Jersey, L. G. Hinsdale, librarian, distributed 5000 manuals on canning and drying to the housewives of the city on Food Registration Day. These manuals were given at the polling places as a helpful contribution to the women in the food conservation work for which they were being registered.

In Chicago the public libraries entered with genuine enthusiasm into the work of stimulating canning and drying operations. In requesting the co-operation of the Commission, Assistant Librarian C. B. Roden wrote that 10,000 manuals would not last a week in the 40 branch libraries in their distribution of the booklets to the housewives of Chicago. Impressed with the spirit shown by the request the Commission sent 20,000 manuals instead of the 10,000 that had been asked for—making the biggest single consignment sent to any library system in the United States.

drying were given to the pupils with instructions that the booklets were to be taken home so that their entire households might be benefited by the helpful information. Advices received in Washington during September and October indicated that these manuals were eagerly used by the school communities and that results of great importance were achieved along the line of food conservation.

Typical of the recognition accorded the Commission's work is this editorial comment from the New York World: "The announcement of Charles Lathrop Pack, president of the National Emergency Food Garden Commission, that housewives this year have canned 400,000,000 jars of fruits and vegetables indicates a very large addition to the nation's food supply. Like the perishable product of the small home gardens, it is not to be measured accurately, but no one can question that the impetus given to individual effort through public agitation has been of immense help. No government census can ever fully cover so wide a field of activity or give exact figures for the total output."

Similar editorial comment appeared in the Chicago Evening Post as follows: "The Department of Agriculture, as we noted recently, omitted from its crop report any estimate of the home gardener's crops. The backyard farmers, however, are not lost sight of by their Uncle Sam. Charles Lathrop Pack, of the National Emergency Food Garden Commission, after a careful survey, reports that there are more than three times as many gardens growing vegetables in the United States today as there were a year ago. The increase represents a gain of one million, one hundred and seventy-five thousand acres, and he estimates the total home garden crop will aggregate \$350,000,000. If you doubt whether the home garden is a real factor in the food situation ask the man who peddles vegetables in your neighborhood."

It has not been alone in the United States that the work has gained recognition. Newspapers and letters have been received from Great Britain, France, Italy, Australia, Hawaii, the Virgin Islands, Cuba, South America and other far away corners of the globe, showing that the Commission's home garden movement has attracted the attention of the press of the entire world. From many of these countries have come requests for the literature issued by the Commission. One such request came from Nigeria, British West Africa. The letter was from D. O. Gundsdlabor, of Opobo, who wrote: "There are signs here of inevitable famine and we are doing all we can to save the situation. This means the storing of food and the best way to preserve it. How can I store and preserve such foods as are common in this section of Africa?"

It is needless to say that the full literature of canning, drying, pickling and storing was sent Mr. Gundsdlabor by the first mail and that the Commission's experts gave him all available additional suggestions that would apply to his particular conditions of climate and products.

One of the whimsical, but impressive, suggestions arising from the campaign was that if the season's home canned jars should be placed in a pyramid with the Washington Monument as a center, the structure would completely hide the towering shaft which dominates the landscape of the National Capital. It was also suggested

that the jars do not have to be collected into a pyramid in order to stand as a monument to American patriotism. Tucked away on pantry shelves from East to West and from North to South they make a fortress of impregnable strength in this crisis which demands all the strength the nation can muster. They are the foundation of America's wartime preparedness. The food thus conserved has a value as vital as the country's armed forces. In the battle for world freedom these household stores are as important as our soldiers; the jars as potent as our blue-jackets and the cans as powerful as the cannon.

Among the constructive activities of the Commission none proved more useful or attracted more widespread attention than the offer of \$5,000 in prizes for home canned vegetables from home gardens. The fund was divided into a thousand prizes of \$5 each, awarded at local fairs and food exhibits throughout the country during September and October. The competition was keen and close observers agreed that no single incident of the food thrift campaign did more to stimulate interest

in home canning than this contest. At state, county and local fairs and at public exhibits of various kinds the prizes were eagerly sought. With the close of this month 1000 home canners from coast to coast will have received the individual rewards in cash, together with certificates issued by the Commission giving permanent record of the holder's success in the competitive enterprise.

While congratulating itself on the results achieved, America is in no position to rest on its oars. This point

THE SLACKERS



I WISH I WERE the license clerk
Who grants the right to wed,
For I'd bring up with vicious jerk
The man who hides his head
Behind the heart of some poor girl
Who little knows the craft
With which he's set her brain awl
That he may dodge the draft.

'Twould do me good to take the chap
And kick him down the stairs,
And thus bestow a needed slap
On these misguided pairs.
I'd make each slacker heed the call
To take a gun and fight
The foe whose cruel deeds appal
All men whose souls are right.



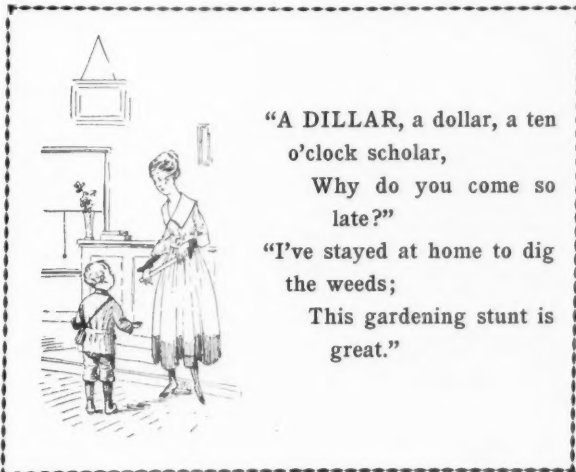
But since I have no license job,
To catch this shameless shirk,
I'll form a little private mob
And do some other work.
'Twill give me joy to slug and swat
The folks who help the foe
By wasting, or by letting rot,
The stuff their gardens grow.

I'll drive them to the garden patch
With patriotic haste,
And make them hustle to the scratch
To stop this sinful waste.
I'll make them get a wiggle on,
And either can or dry
The garden truck, ere summer's gone,
For winter time supply.



There'll be no slackers left alive
If I can have my way;
For I will make a mighty drive
And set them making hay.
The bridegroom slackers, conscience
knows,
Deserve a deadly shaft;
But after all I'm out for those
Who dodge the Food Thrift Draft.

was given emphasis in the early autumn when 125 cattle raisers met in Washington to confer with Secretary of Agriculture Houston and Food Administrator Hoover over the world-wide shortage of meat. These producers were told by the representatives of the federal government that the shortage will continue for several years.

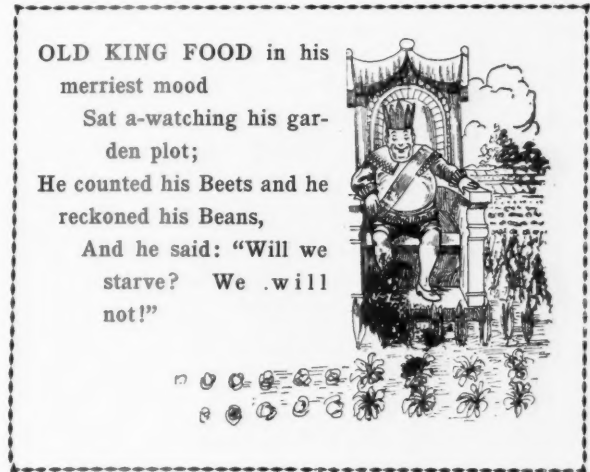


With this condition before us the Commission urges every city gardener to look ahead to the coming year of production and conservation.

It is not merely a question of today, but one of tomorrow that we must answer. With the prospect of having close to two million men under arms and the possibility of having to help feed a big part of Europe, we are confronted with the vital need for planning ahead for 1918.

Germany reports that its war gardens produced more this year than any year since the war started. This shows the value of experience. We have had one year's experience and have raised \$350,000,000 worth of pro-

duce in our war gardens. Next year we must do even better. We will then have more war gardens and the average product will be larger. Housewives of this country this year have preserved and canned at least 450,000,000 jars of vegetables and fruits. Next year, profiting by their experience of this year, they will can



millions more. More will be needed, for too much emphasis cannot be placed on the fact that there will be a greater demand for food exportation next year than there ever has been before. We must fill this demand. To make this possible the home gardeners must augment their forces and increase their labor of patriotism and the soldiers of conservation must extend their activities in canning, drying and otherwise preparing foodstuffs for winter uses. To reap the full benefit this year's experience must be applied to the solution of next year's problems. That the results will then be even greater than those of 1917 is assured and America will win renewed recognition as the most powerful factor in the great war for human rights.

J. DENNY O'NEILL, who recently became state highway commissioner for Pennsylvania, has issued a statement advocating the planting of trees along the roadside throughout the state. He urges that the shadeless roads of the state be transformed into well-shaded avenues, and is particularly strong in his advocacy of fruit trees for this purpose. As especially desirable he suggests ox-heart cherry and the apple tree. For purely shade trees he suggests the sugar maple and red oak. In a letter to the engineers and road superintendents of the various counties he instructs these officials to interest residents along the highways, by appeal through caretakers and foremen on state roads. He names fall arbor day, October 26, as a good time to make a start.

THE ENDURING strength of wood is evidenced in the Fairbanks house in Dedham, Mass., built in 1636, and believed to be the oldest frame house in the United States. The oak timbers were brought from England about 1635. They are still solid.

THE GULF, Mobile & Northern Railroad plans extensive improvements at Mobile, Ala., to cost \$1,000,000. The project includes three new piers and a series of warehouses. The new construction will be especially designed to handle lumber traffic. One pier will be arranged to take care of 2,000,000 feet of sawed lumber, and another will have a capacity of 5,000,000 feet. The plans have been submitted to the War Department, and after approval the railroad company will need a large amount of piling and timbers.

THE Harvard Graduate School of Business Administration in co-operation with the Department of Forestry, announces a course in the lumber business for college graduates who look forward to undertaking some branch of lumbering for a life work, and also to graduates of forestry or engineering schools who desire special instruction in the lumber business. The course covers two years, and upon completion graduates are given a degree of Master in Business Administration.

THE LURE OF THE BEAVER

BY D. LANGE

With Photographs by the Author

BEAVERS have been called animal engineers, and the title is by no means an empty honor. No animal possesses such remarkable constructive ability as the beaver. Even the most sceptical scientist who sees the dams they have constructed, the dome-shaped houses they have built, the canals they have dug, the trees they have felled and the piles of brush and poles they pickle for their winter food will marvel at the intelligence of these furred dwellers of the wilderness, and will secretly wonder, if after all, beavers might not possess a spark of human reason.

The Chippewa Indians believed that the beaver people once did possess both human reason and a human language, but Manitou had to take away from them the power of speech so that they would not become wiser than the Indians themselves.

When North America was discovered, the beavers lived on almost every stream and lake north of Mexico and were an important source of both food and clothing for all the tribes inhabiting the present Northern States and Canada. So numerous and so generally distributed were these animals that the needs of the Indians made no impression on their numbers.

With the increase of trade between America and Europe the beaver became a veritable animal of fate to both Indians and Whites, and within historic times no other animal has played such a fateful part in the suppression of one race and the spread of another and indeed in the conquest of a whole continent by the white race as the American beaver. Beaver wool, the

fine dense fur which protects the beaver from the icy water of his habitat, was found to be the most suitable material in the manufacture of fine hats, and for more than two centuries, until 1825, the European markets were insatiable in their demand for beaver furs. From a very modest beginning the American fur trade rose to world wide proportions and importance. Such in-

trepid explorers, pioneers and traders as Kit Carson, Jim Bridger, George Cartwright, John Jacob Astor, Larpenteur, the two Henrys and unnumbered nameless and forgotten adventurers and explorers who wooed fortune, suffered untold hardship, faced death, and committed dark and bloody crimes as loyal servants of three great rival fur companies, all followed the lure of the beaver. They followed him to the small headwaters of the Mississippi and St. Lawrence and they crossed the divides and followed him down the streams which send their waters to the distant Pacific and to the ice-bound Arctic.

When the Americans had won their liberty in the Revolutionary War, tobacco was no longer used as currency in Old Virginia, but beaver skins were still the standard of value in the

country of the upper Great Lakes and in vast regions farther north and west. A few records from the Jesuit Relations and other documents of the eighteenth century are interesting, and the present day reader may even find grains of humor in them. One of the Jesuit Fathers reports that, "in 1656 Monsieur de la Poterie opened a tavern at Three Rivers at which wine was sold to the savages, two pots for a winter



OUR FRIEND THE BEAVER

The clever, sagacious, hard-working animal—the chief engineer of the animal world—not so protected by game laws that the chance of his becoming extinct is growing remote.



Courtesy of the American Museum Journal

YOUNG BEAVERS AT HOME

Part of the new group recently constructed in the American Museum.

beaver and one pot for a summer beaver." Monsieur the Governor of Montreal ordered this tavern closed but the order was not obeyed.

About 1761 the trader, Alexander Henry, spent



A FAT BEAVER TRAPPED

The trap was placed near the top of his house and he was caught as he was entering it. He has been shipped to the state game farm of Wisconsin and is prospering there now.

some time at Mackinac in the present State of Michigan. From this place, which was for many years an important point in the fur trade, he relates the following incident:

"The Jesuit father killed an ox which he sold by the quarter. He took for the meat the same weight in beaver skins. Beaver skins were worth a dollar a pound. Money is very little used at Mackinac, all trade being carried on in furs. A pound of beaver skins is worth sixty cents in trade."

In 1776 the same trader visited the Assiniboina at Fort des Prairies in the Saskatchewan country, and a few paragraphs from his journal give interesting glimpses of the trade in beaver skins in the far west.

"Four different interests," he writes, "were struggling for the Indian trade of the Saskatchewan, but fortunately they had this year agreed to join their stock, and when the season was over to divide the skins and meat. This arrangement was beneficial to the merchants but not directly to the Indians

who . . . paid greater prices than if a competition had subsisted. A competition on the other hand afflicts the Indians with a variety of evils in a different form.

"The following were the prices of goods at Fort des Prairies:

	Beaver Skins
A gun	20
A stroud blanket	10
A white blanket	8
An axe of one pound weight.....	3
Half a pint of gunpowder.....	1
Ten balls	1

but, the principal profit accrued from the sale of knives, beads, flints, steels, awls and other small articles.

"Tobacco, when sold, fetched one beaver skin per foot of Spencer's twist, and rum, not very strong, two beaver skins per bottle; but a great proportion of these commodities was disposed of in presents.

"The quantity of furs brought into the fort was very great. From twenty to thirty Indians arrived daily, laden with packs of beaver skins."

The meat which Henry refers to was not beaver meat, but dried and smoked buffalo meat. Although beaver meat is good eating and was freely used by both Indians and Whites in the fur country, I have rarely found it mentioned as an article of trade, while the meat of buffalo, deer, elk and moose was a common article of trade. For curing the meat, the beaver was too small an animal.

In places where there was no competition, it is claimed that traders made a profit of 2000%. Father Charles Lemant writes that about 1625 the French Trading Company exported from Quebec 12,000 to 22,000 skins annually. The Company paid 4 1-3 livres



BEAVER ON THE DAM

The animal swam down the stream and climbed on top of the dam just as the photographer took the picture. It is exceedingly difficult to get such a photograph in the beaver's native haunts.

in Quebec, and the skins sold in Paris at one pistole apiece, which amounts in our money to a buying price of 85c and a selling price of \$4.00.

A good trapper in a well-stocked country could catch two to three hundred beavers in one season and secure a good deal of other fur at the same time.

Many Indians, becoming temporarily rich beyond their dreams, invested their wealth in all kinds of silver ornaments which they could wear on their persons. Whole Indian villages went annually on a drunken debauch when they had carried the product of their winter's hunt to the traders, for rum was one of the great staples in the Indian trade. Its sale was immensely profitable, and no one trader or company could stop the unspeakable havoc it caused among the Indians; for if one trader had no whisky, or refused to sell it or give it away as presents, the Indians took their peltries to one who would give them plenty of the white man's milk.

It is not surprising that an animal of such commercial importance and remarkable habits as the beaver aroused the interest of travelers and scientists. But as most travelers had neither the time nor the patience to make personal observations on an animal so shy and wary and largely nocturnal in its habits, many absurd stories of its life became current and were accepted by credulous writers and a still more credulous public.

Some of the most interesting glimpses of life and conditions in the beaver country during the height of the fur trade may be gained from the narrative of John Tanner, a white man, who, when a boy eleven years old, was kidnapped by some Shawnee Indians in Boone County, Kentucky. He was sold by his captors to Netnokwa, a Chippewa woman, who adopted him as her own son. He lived amongst the Chippewa from about 1780 to 1830, mostly in the regions now embraced in Northern Minnesota, Ontario, Manitoba, North Dakota and Assiniboia.

Referring to a bear hunt which ended a period of starvation, he relates the following: "The old woman said, 'My son, look in that kettle and you will find a mouthful of beaver which a man gave me since you left us this morning. You must leave half of it for Wamegonabiew (her son) who has not yet returned from hunting, and has eaten nothing today.' I accordingly ate the beaver meat, and when I had finished it, observing an opportunity when she stood by herself, I stepped up to her and whispered in her ear, 'My mother, I have killed a bear.'"

From other remarks of John Tanner one may glean the sad story of the degradation of the Indians as well as the story of the rapid extermination of the beaver.

Netnokwa and her sons had visited an old friend,

Peshauba, in the present province of Assiniboia. The party started in canoes down a tributary of the Assiniboin River with all the furs Peshauba had accumulated during several years of hard labor. They intended to return to their former home on Lake Huron. Of this journey Tanner writes:

"When we came from the Little Saskajawun into the Assiniboin River, we came to the rapids, where was a village of one hundred and fifty lodges of Assiniboins and some Crees. We now began to feel the want of fresh provisions, and determined to stop a day or two to kill sturgeon at this place where we found a plenty of them. . . . In two days from these rapids we came to Mouse River where both the Northwest and the Hudson's Bay Company have trading-houses. Here Peshauba and his friends began to drink, and in a short time expended all the peltries they had made in their long and successful hunt. We sold one hundred beaver skins in one day for liquor. The price was then six beaver skins for a quart of rum, but they put a great deal of water with it. After drinking here for some time, we began to make birch canoes, still intending to continue on our journey."

The journey was never completed. After telling of two years of toilsome wandering back and forth, of hardships and misfortunes, Tanner again strikes the sad refrain which rings through all the stories of the unbounded forests of the Indian and the beaver:

"The old woman, being much dissatisfied at the misconduct of her son, the disappointment of her hopes of returning to Lake Huron, and other misfortunes, began to drink. In the course of a single day she sold one hundred and twenty beaver skins with a large quantity of buffalo robes, dressed and smoked skins and other articles, for rum. It was her habit, whenever she drank, to make drunk all the Indians about her, at least as far as her means would extend. Of all our large load of peltries, the produce of so many days of toil, of so many long and difficult journeys, one blanket and three kegs of rum only remained, besides the poor and almost worn-out clothing on our bodies. I did not, on this or any other occasion, witness the needless and wanton waste of our peltries and other property, with that indifference which the Indians seemed always to feel"

"We repaired to Rainy Lake trading house, where we obtained a credit to the amount of one hundred and twenty beaver skins, and thus furnished ourselves with some blankets, clothing and other things necessary for the winter."

For about a hundred years, during the eighteenth century, Canada practically lived on beaver furs. Beaver skins paid for her imports from Europe; in beaver furs the church received its tithes, and in beaver furs the converted Indians paid for the mass which the priest read for the souls of the departed

braves. It is quite fitting that the beaver has been given a place on the national coat-of-arms of Canada.

In the valuable historical documents known as the Jesuit Relations, no animal is so frequently mentioned as the beaver, and the journals of all the early traders and explorers show that from about 1600 to 1825 and even later, the beaver was over a region larger than all western Europe, of as much economic importance to the inhabitants as gold was in the early days of California and as cotton is now in our Southern States.

Under these conditions the slaughter and destruction of the beaver proceeded at a fearful rate. The annual export of beaver skins probably did not much exceed half a million, but it is likely that two millions of the animals were killed every year.

The beaver hunter, like the placer miner, exhausts the source of his wealth in any one locality very soon, and is compelled to move into new regions. Beavers, in spite of their apparent sagacity, are easily caught, and as their size and manner of life make concealment impossible, the beaver population has so rapidly decreased that today there are probably not

more than 500,000 of them alive in the whole of North America, although the original beaver population of the continent must have been at least 50,000,000.

In 1871 the Hudson's Bay Company still furnished 174,461 skins, in 1905 the supply had fallen to 54,119. The total production of beaver skins from 1672 to 1902, largely based on figures of the Hudson's Bay Company, is estimated at 3,000,000 skins, and valued at \$100,000,000.

About 1825 the Hudson's Bay Company absorbed the Northwest Company and the ruinous competition in the fur trade and the unrestricted liquor traffic came to an end. The company did much for the Indians and prevented the wanton extermination of beaver in its territory. About the same time silk was substituted for beaver hair in the manufacture of hats, and this

invention also checked the destruction of the animals. Since that time beaver skins came within reach of the furrier. A good beaver skin now brings the trapper about \$8.00 and a full length beaver coat is worth about \$200.00. Beaver fur is not in prime condition until February and March, but in the early days the Indians killed some for both food and fur at all seasons, although they did most of their trapping during the winter months.

When, in 1869, the Hudson's Bay Company surrendered its sovereignty to the Dominion of Canada, the humble wild fur bearers lost their best protector, and are now rapidly following the buffalo and the elk

in all regions where they are not rigidly protected. With them the most interesting animals of our whole fauna, the founders of American commerce, the first engineers and the first lumbermen of North America, will be seen and heard no more on the streams in the forest, where their ancestors have worked and played since the leaves of the aspen first began to whisper in the summer breeze.

Where, however, the beaver is actually pro-

ected, it not only holds its own, but increases rapidly. This has been shown in Minnesota, Ontario, Michigan, Wisconsin, and elsewhere, for under favorable environment no animal is better fitted to take care of itself.

In 1902 three beavers, one male and two females, were set free in the Itasca Forest Reserve of Minnesota, where the species had become extinct. The liberated beavers built a house at the mouth of Nicollet creek that same fall and within ten years they had spread over the whole of the Reserve and had built about thirty lodges and had made half a dozen large ponds.

In a settled farming country, beavers would not be desirable, because their dams will flood meadows and they cut down quite a few trees and kill others by flooding their roots. In a wild country, however, the



Courtesy of the American Museum Journal

HOW BEAVERS CUT TREES

Black ash cut by beavers near Port Kent, New York. Gift of W. H. Howell, on exhibit at the American Museum. The cuttings show characteristic marks of the beaver's teeth.

trees they kill have no value. Where beaver have to be killed or removed the work should be done under the direct control of an efficient State Game Department.

Wherever general trapping is permitted, the animals will soon become extinct. I believe, that in certain wild regions as on Isle Royale, in Lake Superior, colonies of beaver might yield a reasonable income, if properly managed.

Against their natural enemies they are well protected. Lynxes and wolves cannot attack them in the water nor in their houses or burrows. I have seen



OPENING A BEAVER HOUSE

The opening in this beaver house is large enough to admit a man who is well on his way to explore the interior. Note the large branches of which it is built.

otter trails near beaver houses and it is possible that this agnostic hunter may attack them in the water or even invade their houses. A hungry eagle would no doubt pounce upon the young, but the beaver children seldom venture more than a few yards from the parental roof and castle.

To harmless woodland neighbors the beavers are indifferent and live at peace with them; and for catching glimpses of the life of the wood folk there is no better place than a beaver pond.

At one place I observed daily from my shelf-platform in a tree the feeding and playing of a brood of black ducks. A young woodchuck also browsed right below me and used the beaver dam as his turnpike. Once he tried to cross the stream on a pole, but lost his hold and fell with a splash into the water.

At another pond, a flock of Canadian jays tried to steal my bacon out of the frying pan, and at a third pond I observed the play and calls of loons that were unconscious of my presence, and I watched deer feeding for an hour near a beaver clearing.

The Indians indulged in many practical jokes at the expense of their pious Jesuit teachers. One of



HOW A BEAVER SAVED WORK

Whether the animal knew how to do it or not the fact remains that this tree was felled after the beaver had cut through only one side of it.

them, Father Joseph Louvence, tells us that the beavers have two teeth projecting from the sides of their mouths like swords and that they use these like saws in cutting down trees, that their houses are divided into several stories and that their dams are so ingeniously built that one could expect nothing better from the most skilful architect. The account shows that the good father had never seen a beaver house, a dam nor a beaver.



PINE TREE CUT BY BEAVER

Note the size of this tree and guess the amount of work required to cut it down. The power and sharpness of the beaver's teeth may be judged by the fact that some of the chips are four inches long.



A BAD NEIGHBOR OF THE BEAVER

The lynx is frequently found along the water side where beavers are active. He is one of their worst enemies, but can catch them only in the open, as their houses are lynx proof.

I had casually observed a few beaver colonies in the wilds of Northeastern Minnesota, in Northern Wisconsin and in the Itasca Forest Reserve, and so attractive did I find their habits, that one summer I devoted over a month exclusively to studying them in the Itasca Reserve; but the difficulties I encountered in trying to secure new and reliable information were at times quite baffling.

My first attempt was made at a dam and pond in a dense cedar swamp. In company with two friends



A MUSKRAT HOUSE

This is a cross section showing the interior chamber and entrance under water or ice. The boy has his left hand in the entrance to this domicile.

I made a small break in their dam and staid near the break all night. Early in the evening we suffered not a little from mosquitoes, and in the morning from cold and dampness. Several times we heard a beaver plunge and slap the water with his broad tail, and once he almost spattered water on our blankets, but the break in the dam was not repaired. At sunrise, three shivering and bedraggled naturalists were longingly looking forward to a fire and hot coffee and they had learned that beavers will not work when they know they are being watched.



NEIGHBOR PORCUPINE

The well known but carefully avoided porcupine is one of the neighbors of the beaver, although that does not prove that they have much in common, except a fondness for the same locality.

My next attempt was made on a large pond which the beavers had created by building a dam across a small creek in a more open valley. Here I built against the trunk of a large balsam fir a platform twenty feet above the ground. Two afternoons and evenings I spent alone on that platform after having made a break in the dam. On both occasions I saw a beaver swimming about in the pond as if he were scouting for the cause of the trouble. He was not alarmed and neither saw nor scented me, but he never left the pond and did not repair the dam. When it grew too dark to see anything, I left for my camp two miles away. On both occasions the break was repaired during the night. About the number of beavers living in this pond I had been able to make no direct observations.

Having been disappointed at this pond, I selected a beaver house on the shore of a small lake and directly below a high bank. This seemed a most favorable locality. I intended to observe the beavers from behind some bushes on the high bank; the house was built in the open and was exposed to the west, making the conditions of light very favorable. It was only



SIZE OF A BEAVER HOUSE

This photograph gives an excellent idea of the size and the stability of the beaver house. It is built on the edge of a pond in southern Wisconsin.

half a mile to a good log cabin and I expected good results.

But again I was disappointed. I did indeed see several beavers every evening but they nearly always scented me and gave their plunge-and-slap danger signal, which, at times, was taken up by a colony on the other side of the lake until the resounding plunges made a noise as if half a dozen concealed giants were throwing rocks into the lake. Building a platform in a jack pine did not bring better results; the beavers always knew I was there.

At last I discovered the source of my difficulties. Towards evening the wind nearly always ceased and a current of air set in flowing gently from the high bank down to the lake.

I now decided to make a large beaver house, located on a point of land across the lake, the scene of my investigations. An open grove of poplars covered this point and I planned to build a comfortable platform almost vertically above the beaver house by connecting three of the trees by means of stout poles and strong boards. On shore near my camp I built a raft and a portable ladder and cut the poles and then ferried poles, ladder and boards across. I adopted this method in order to avoid unnecessarily alarming the beavers by much cutting and hammering near their house; still it required four hours of hard work to build my observatory. Having no companion and working eight miles from the nearest settlement the work did not lack a spice of danger. That evening, knowing that the beavers would be alarmed, I re-

mained quietly in camp observing the deer-mice in the cabin and the snowshoe rabbits around the camp-fire, both of which were more numerous than I have ever known them before.

The following day I paddled across the lake on my raft in the middle of the afternoon. The raft enabled me to avoid a long detour around the shore of the lake where the going was extremely bad, especially after dark, and it also made it possible for me to land at the beaver point without noise. After dark, on the homeward trip, I steered for three white birches, near which I tied my raft within half a mile of camp. At the end of a week, however, the craft became so water-logged that the stern travelled ten inches under water, but as I did not have to travel in strong winds and big waves, the raft remained a most convenient and fairly safe transport.

Having arrived at the beaver point I ascended to my platform and waited. About 6.20 I observed a line of bubbles arising near the house and traveling rapidly into the lake, and about two hundred feet from the house, as I had expected, a beaver came up at the end of the bubble line. He scouted about, his nose turned toward the shore, but found nothing to alarm him. Soon another beaver left the house. I could see his dark body under the water but he caused neither ripples nor bubbles. He also, after rising, sniffed the shore, but in another direction, and like his fellow was not alarmed. A little later a half grown beaver cautiously put his head out among the poles at the edge



BEAVER HOUSE IN WINTER

This house was deserted for several years. Late in the fall a colony whose pond had been drained by a poacher repaired the house, hurriedly pickled a large amount of brush and occupied the house.

of the house, and not scenting or hearing anything suspicious, swam away to the feeding grounds.

At last I had found a place and method at which the wariness of the animals would not baffle me, and new facts came rapidly during the week I watched from the platform spiked to the three poplars.

On this level point of land there was no downward air current and the beavers could not scent me. To noise they were not so sensitive as I had expected. The rather loud click of a camera which several times caused a muskrat to plunge with alarm, made no impression on the beavers, and to their eyes the large platform, six feet by three, and myself sitting on it without any screen whatever, conveyed no import of danger.

As far as I could tell they did not see me at all. Once, however, I thought a beaver some hundred yards away caught sight of me against the sky line as I moved to shift my position.

Every evening between six and half past, the young beavers of the season began a sort of child-like whining. Within half an hour after that, one or two full grown animals left the house under water and arose at a distance of about two hundred feet to scout along the shore as already described. In most cases I failed to see them leave the house. Once I saw a large piece of poplar, perhaps three feet long and four inches in diameter, taken into the house under water. I could not see the dark beaver, but only the whitish piece of poplar, and the movement under water produced no ripples on the surface. About ten or fifteen minutes after the old beavers had left, the half grown yearlings generally left the house and all swam towards the feeding grounds, a quarter of a mile to the west. I think there were four of these yearlings. Once I saw



WOMEN WALKING ON BEAVER DAM

Not many women have walked over a beaver dam and those who have see no particular reason why they should do it a second time. These are members of the Minnesota Forestry School at Itasca Lake, Minnesota.



THIS DAM IS FIVE FEET HIGH

So firmly constructed is this dam that despite frequent rise of the stream it still remains firm and strong, its top five feet above the average water mark. It is in Southern Wisconsin.

them leave so close together that their bodies touched one another.

I concluded that the beavers just mentioned were yearlings because they were not full grown, and the house was also inhabited by three or four animals only about the size of muskrats. These little fellows seldom showed themselves and never followed the parents to the feeding grounds so I concluded that they did the whining I regularly heard, because I heard it after parents and yearlings had left the house. This house I now knew for certain was inhabited by about ten beavers belonging to three generations. The two parents, easily distinguished by their large size, always left the house first and scouted along the shore for indications of danger. If their suspicion was aroused, they gave the danger signal and I soon learned that after that I should see very few or no beavers that evening. If they suspected no danger they either swam away to feed or returned leisurely to the house and left again later. Near the house, they never went on land, although from my platform I could see seventeen wharves or landing places. But for some reason the beavers were feeding at this time exclusively a quarter of a mile away.

The house under the high bank also harbored parents, yearlings, and young of the season, but I secured no good evidence as to their number; however, to judge from the size of the house and other signs, the number was less, perhaps only six or seven.

The yearlings did not heed the danger signals of the parents as implicitly as they would do with the writers of nature fiction. Twice one of the parents became alarmed at my raft moored on the other side of the point and gave the plunge-and-slap signal, but the yearlings near the house paid no attention to it although the alarmed parent was not more than two

hundred feet away. The youngsters reminded me of boys who go their own way in life, feeling satisfied that the old man doesn't know what he's talking about.

Contrary to a statement made in a very reliable natural history, the muskrats and the beavers lived entirely at peace with each other, one paying no attention to the other. In the house below the high bank beavers and rats also lived together peacefully, but in both cases the rats generally used small entrances close to shore, and I think they lived in a small cavity in the bank by themselves. In a third house muskrats were also present, but I did not learn on what

man's thumb. The next moment, seizing the butt with his mouth or fore feet—I could not make sure which—he swung the leafy branch over his left shoulder from which it slid off almost immediately; he then seized it with his teeth, dragged it into the water, dived with it and took it into the house. No sooner had he entered than the babies of the family set up a lively whining in appreciation, as I imagined, of the prize the big brother had brought in. This was the most intimate glimpse I had of the beavers' home life and was the only time I saw a beaver on land.

I noted that the beavers never touched the other poplar tops I had dropped almost on their house and they had practically done no cutting in the poplar grove near their house. They nearly always left the house at the same exit and, after the old ones had scouted along the shore, both parents and yearlings often swam directly to their feeding place about a quarter of a mile to the west. Several times I watched one swim as straight as the crow flies with a speed of about one hundred yards a minute.

The most remarkable beaver structures are the dams, built across small streams and creating the well-known beaver ponds. Dams from a hundred to three hundred feet long are common, and in rare instances a beaver dam may reach a quarter of a mile in length. The height of a dam varies from a few inches near the ends to five or six feet in the highest places. It is built of dead brush and sticks held together by mud scooped and dug up immediately above the dam. The beavers had cut no standing trees for any of the dams I had seen. No stakes are driven into the ground and no large rocks used to hold down the brush. The dams are not given any artistic finish, and look as if a lot of boys had built them; but by being kept in repair they hold the water in the pond. The amount of work expended in their construction is very large, considering that a beaver averages only about thirty pounds in weight and has only his small fore feet to use as hands and his four chisel-like teeth for cutting brush, trees and sticks, or for seizing his material when he drags or floats it to his house or dam. I estimated that duplicating a certain three hundred foot dam would take a man equipped with pick, ax and shovel about four weeks.

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Scene in a poplar grove in winter after the beavers have cut down and pickled their supply of brush and food poles. This is in the Itasca Forest, Minnesota.

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extend beyond ten or fifteen years. Of all the wild and weird places one comes upon in the primeval forest, a beaver pond is the most desolate. As the water backs up from the dam, the cedars, tamaracks, spruces and firs gradually die and within a few years they begin to lean and fall in all directions, while long tufts of gray lichens hang, like gray funeral wreaths, from every dead bough. Few men can spend a night alone at a beaver pond without having the primitive fear of the wilderness creep in upon them.

Beaver houses are constructed like the well-known muskrat houses which every country boy has seen in sloughs and sluggish creeks, but the beavers use sticks, poles and mud as building material instead of the rushes and mud employed by their small cousins. A large beaver house stands about five feet above the water and measures from fifteen to twenty feet in width at water level. A large house at the south end of Lake Itasca could be clearly seen at the distance of a mile and a half. Each house has two or more entrances, always under water, but it has only one cavity where from six to ten beavers live, sleep and eat. I found no bedding in the deserted houses I opened, but the cavities were large enough that a man might use them as places of concealment.

The beavers seem to prefer building their houses in ponds where they can control the water level and where no enemy, except man, can reach them, but they also build many houses against the banks of lakes and some of them live in burrows near the water, which was undoubtedly the manner in which their ancestors lived long ago. How and when they learned to build dams, create artificial ponds and build their dome-shaped houses we can, at present, only surmise.

Some of the extinct relatives of the beavers were several times as large as the present race, and one grotesque species was even provided with horns.

Fully as striking as the hydraulic engineering of the beavers is their lumbering. The term beaver clearing is not hyperbole, for they frequently fell from one to two hundred trees, occasionally taking a tree of two feet in diameter, but they prefer trees from a few inches to a foot thick. Just as the tiny wild mice cut down grasses to secure the seeds, the beavers fell trees to feed on the twigs and on the bark of the boughs. Accurate observation shows that they do not determine the direction in which the trees fall. Most of them fall naturally toward the pond or lake; but in a large clearing trees may be seen lying in all directions and many become lodged in the tops of other trees. These lodged trees do not fall to the ground and are lost to the beavers. An intelligent lumberman secures every tree he cuts.

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vented the water from flooding the ice and rising into their house or causing uncontrollable leaks in the dam.

The domes of their houses freeze hard in winter, and while wolves and deer and all kinds of animals pass freely over the frozen ponds, it is impossible for any creature, except a man with an ax, to open a beaver house in winter.

I would not ascribe human reason to the beavers, but in the sphere of their own peculiar life and activities they do certainly display such a marvellous instinct and adaptability that one is ever tempted to ascribe at least a high degree of intelligence to them. However, comparing the beaver's intelligence with that of wolves, domestic dogs, coyotes and foxes, I should rate it rather low. The wild flesh-eaters have every man's hand against them, but still they hold their own. With remarkable adaptability they have learned to avoid guns and traps, hounds and even poison. The beaver has become wonderfully adapted to an aquatic life and to the advantages of his ponds, dams and houses, but as compared with the wild canines the castors seem a dull tribe. It is easy to trap all or nearly all of a colony of beavers, but nobody ever trapped all of a pack of wolves. Wolves hold their own wherever they find food and shelter. Beavers became extinct over immense areas where their food and shelter existed in abundance, because they adhered stubbornly to the ways of their ancestors. They were guided too largely by instinct and were too slow to learn.

I shall illustrate by three instances how tenaciously beavers follow the bidding of instinct and how slow and dull they are in grasping a new situation.

A pair of beavers built a dam across a creek which furnishes the water for the State Lodge in the Itasca forest. Twice the dam was torn out and twice the beavers came at night and put it in again. Then a lighted lantern was left near the place. The first night they avoided the place, but during the second night they again built their dam. Then in despair, the lodge keeper set a steel trap and caught one of the beavers. When after daylight the man approached the trap, the animal broke away, leaving one of his

toes in the trap, and at last this beaver and his mate understood that this creek was not a safe place for building a dam.

Two other interesting instances bearing on the beaver's intelligence have come to my notice. I was watching beavers from my platform on Poplar Point. As already told, both beavers and rats inhabit the same house and both were perfectly at home with each other. One evening about 7:30 a muskrat came swimming home with a water lily leaf, which had accidentally turned up on edge. Almost directly below me a yearling beaver was lying with his head out of the water. When the rat approached him within about a foot he took a sudden fright and dived and rushed into the house in such a wild panic that I could see only a streak of swirling water. This beaver had many times seen a rat come home with a lily leaf, but at the somewhat unusual position of the leaf he was thrown into a panic and rushed for the house.

One of my friends, a forester, saw a beaver on shore toward evening. A rabbit hopped out of some bushes near by, and the beaver rushed into the water in a wild fright. There were literally thousands of rabbits in the Itasca woods and the scent and shape of a rabbit must have been well known to the beaver.

This tendency to panic does not speak for a high grade of intelligence, but it must be admitted that a tendency to rush for the water or the house would be beneficial to the beavers against their four-footed enemies.

But though we admit freely that the Indians and early writers overrated the intelligence of the beaver people, their ways and works will always lure the naturalist into the wilderness.

Nature has been most sparing in the bestowal of her greatest gift. Where the dim, flickering candle of animal instinct and intelligence has been sufficient, she has not turned on the brilliant searchlight of human reason.

The works of the beaver, executed under the guidance of a human mind, would be nothing remarkable; only when accomplished by a creature guided by instinct and a humble animal mind do they appear truly wonderful.

CHESTNUT blight has already done damage in Pennsylvania estimated at from \$9,000,000 to \$10,000,000. No tree attacked by it has ever been known to recover, although dozens of fake remedies have been brought out.

O. M. BUTLER, assistant district forester of the United States Forest Service, Albuquerque, New Mexico, has been appointed assistant director of the Forest Products Laboratory, at Madison, Wisconsin, and has assumed his duties. Mr. Butler has been engaged in Forest Service work for ten years, principally in the West, where he was at different times assistant district forester in various districts.

UNRESTRICTED grazing in the woodlot is a losing proposition. The farm woodlot cannot serve profitably for the production of timber and also as a pasture for stock. Either all grazing should be stopped and the area given over exclusively to the growth and reproduction of trees, or else the trees should be cut and the land used for the production of grass.

IT has cost France over \$30,000,000 to learn that denuded forest areas must be reforested. Pennsylvania and other states are learning the same lesson in the same way.

MARSH LAND AND OTHER AQUATIC PLANTS

By DR. R. W. SHUFELDT, C. M. Z. S.

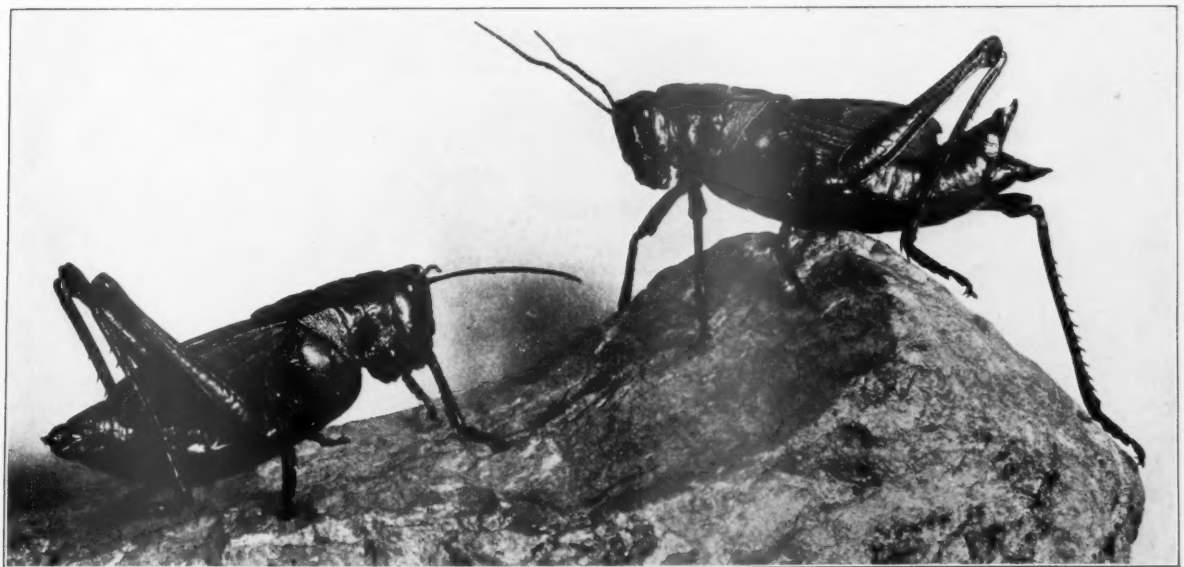
FREQUENTLY, while carrying out their instructions or making their investigations, our foresters are not always confined to the high timber lands or to the forests of the valleys and more level stretches in the regions where they are on guard. Often slow streams have to be crossed, swamps waded, or lakes and big ponds skirted, as they follow the many itineraries throughout the heavily timbered parts of the country where their duties call them. In these latter localities they will be very sure to meet with a great number of our water or aquatic plants. Some are more or less inconspicuous forms, and so rarely attract attention; but upon the other hand many of them are among the most visible of any of the representatives of our flora, and the present article will be devoted to giving brief accounts of their characters and other points, through which they may be readily recognized.

Let pickerel weed be taken as the first example, and we have two good figures of it illustrating the present article. Many who have pulled or paddled through miles of it in a boat or a canoe; who have seen thousands of its beautiful, purplish-blue flowered spikes, and who are more or less familiar with its stems and leafage, have never happened to find out that the name of the genus in which it belongs is *Pontedaria*, it having been named for Giulio Pontedera, the famous botanist of Padua, who flourished in 1730, nor that the deer up in the Adirondack Mountains regularly go down to the shores of the

lakes there to browse upon the leaves of this very same pickerel weed. Its flowers are extremely ephemeral, and bloom but for a single day. Mathews is mistaken when he says that it is a tall plant, "with one blunt arrowhead-shaped, dark green, thick leaf," for we frequently find specimens of the plant supporting *two* such leaves—indeed, such an example is here figured. Another peculiar thing about the pickerel weed is the fact that its fruit—a curious little bladder-like affair—contains but a single seed. It is also said that the flowers of this plant are sometimes *white*, and such specimens have been most frequently observed in the northern parts of its range. It blooms from July to the middle of September, and it is often associated with the arrowhead, to be described further on.

Pickerel weed flowers are comparatively safe from the ruthlessness of the wild-flower vandals, for most of them are found along the river banks, and those growing in a pond are too far out in the water to be reached, which fact is the best protection that the plant possesses.

Doubtless pickerel lay their eggs among the leaves; and there is no doubt but that this splendid fresh-water game fish is frequently found in abundance where the plant grows. Then, too, the insects attracted by the blossoms often fly low over the surface of the water; a hungry pickerel may take a fancy to some of these, so that, by a sudden leap, he may succeed in capturing such tid-bits. It may be said in passing that the pickerel weed



OUR LARGEST SPECIES OF GRASSHOPPER

This is the lubber grasshopper or locust of the southern United States. It is a remarkable large-bodied genus, with short red wings, and shiny, jet black body; the antennae or horns are also short. Its scientific name is *Rhombaleum micropterum*, and it has a near relative in the West which is a greenish species. In the environs of New Orleans, the very small, intensely black young ones hatch out in the cracks in the dry, verdureless patches in the woods, and at a short distance look like little black anastomosing veins on the ground. Dr. L. O. Howard says: "It occurs frequently in enormous numbers in the rice fields near the mouth of the Savannah River, and is an extremely disagreeable object on which to step; in fact, it reminds one of Thackeray's famous remark when he swallowed his first saddle-rock oyster." The two males here shown are New Orleans specimens.

family (*Pontederiaceae*) contains but one other plant besides the true pickerel weed, and that is the mud plantain (*Heteranthera reniformis*), which bears but very slight resemblance to the former.

The story of the very essential cross-fertilization of the flowers of the pickerel weed reads, as we often say,



A GLIMPSE OF THE HISTORIC POTOMAC

View from the Maryland side of the river, below Great Falls. On the bank in the foreground is seen growing both Broad-leaved Arrow-head (*Sagittaria latifolia*) and Pickerel Weed (*Pontederia cordata*). The trees here shown are upon a small island, where, in days gone by, a pair or two of turkey buzzards used to breed.

like a fairy tale. It seems that there are three kinds of blossoms on the spike, "one raises its stigma on a long style reaching to the top of the flower," says Neltje Blanchan in her excellent account of it; "a second form lifts its stigma only half way up, and the third keeps its stigma in the bottom of the tube. Now there are two sets of stamens, three in each set, bearing pollen grains of different size and value. Whenever the stigma is high, the two sets of stamens keep out of its way by occupying the lowest and middle positions, or just where

the stigmas occur in the two other forms; or let us say, whenever the stigma is in one of the three positions, the different sets of stamens occupy the other two. In a long series of experiments on flowers occurring in two or three forms—dimorphic and trimorphic—Darwin proved that perfect fertility can be obtained only when the stigma in each form is pollenized with grains carried from the stamens of a corresponding height. For example, a bee, on entering the flower, must get his abdomen dusted with pollen from the long stamens, his chest covered from the middle length stamens, and his tongue and chin from the set in the bottom of the tube nearest the nectary. When he flies off to visit another flower, these parts of his body, coming in contact with the stigmas that occupy precisely the position where the stamens were in other individuals, he necessarily brushes off each lot of pollen just where it will do the most good. Pollen brought from high stamens, for example, to a low stigma, even should it reach it, which is scarcely likely, takes little or no effect." As pointed out, cross-fertilization is extremely essential, and in these "three-formed flowers there are two chances to one of securing it." Darwin



A FAMOUS PLANT OF THE SWAMPS AND RIVER BANKS

This is a beautiful specimen of the Pickerel Weed, the spike on either hand being in full bloom, while the center one has gone to seed. So luxuriantly does this plant grow in some rivers that it has greatly interfered with navigation, and special means have been recently devised in order to clear the usual shipping tracks of it. Three forms of Pickerel Weed are described,—that is, different flowers on different plants, and the whole group depend entirely upon visiting insects for fertilization. In late summer, when creeks, swamps, and ponds dry up, the Pickerel weeds turn brown, wither, and die, and frequently the seeds are lost in the dry mud wherein the sorry plant now finds itself.

made hundreds of such experiments, all with the same patient care and thoroughness, describing them with marvelous lucidity and point. Little wonder that when his life ended England found a place for him in Westminster Abbey.

Growing with the pickerel weed, we frequently find another famous aquatic plant, the arrow-head, a specimen of which is shown in one of the accompanying figures; the fertilization of its flowers, too, is a story most wonderful in all its details, but it would occupy too much space to give in detail here. There is but one thing to do: "Get your botany," and bring your compound microscope into play. Although a thousand cannon are barking away as these lines are being written, we must not overlook the fact that the war must come to an end some day; the far-seeing wise ones will not put entirely aside scientific research until it is over. When the upbuilding and the uplifting again fills the room of killing



THE ELEGANT SPIKE OF THE PICKEREL WEED

This gives the purplish-blue flowers full size, in that their great beauty may be the better appreciated. The distal portion of a leaf of this plant is shown below, with a young, sheathed spike just ready to burst open. Each plant has several leaves, and they sheathe the main stems as shown in one of the figures. They appear truly gorgeous in the bright sunlight of summer; and they are not only beautiful but extremely picturesque as they line, in thousands, our river banks at this season.



ONE OF OUR MOST CONSPICUOUS AQUATIC PLANTS

This, the common large Yellow Pond or Water Lily, also called the Cow Lily or Spatter-dock (*Nymphaea advena*), is another strictly aquatic plant of our flora of very wide distribution. It prefers the shallow shore-stretches of slow streams, and less frequently extensive ponds or standing fresh water anywhere. In suitable localities it may be found from Nova Scotia to the Gulf, and westward to the Rockies. This species is almost entirely scentless, while its beautiful relative, the great white water lily, has a flower that is extremely fragrant—indeed, so much so that it has been called *Castalia odorata*.

and destruction, no one of the many departments of biology must be utterly dead—as has previously happened in the world's history.

There are a good many species of *Sagittaria*, but they all belong, with numerous other genera, in the water plantain family (*Alismaceae*). The one to be described here is the Broad-leaved Arrow-head (*S. latifolia*) (see figure). It is well named, for sagitta is an arrow, while the specific name refers to its broad leaves. One of its chief charms is its decorativeness, and hardly any one can pass the plant in nature, where it is growing luxuriantly, without being struck by its peculiar beauty. Its flowers are arranged in groups of three, and are very striking from the fact that they are so glistening white. Below them, also arranged in groups

of three, we find the inconspicuous pistils, hardly entitled to be called flowers. The two sex-elements frequently occur on separate plants; but this does not prevent cross-fertilization through the agency of visiting bees and flies, so the plant is sure of perpetuation.

One of the most remarkable things about this arrow-head is the fact that the plant frequently develops two kinds of leaves—a character often to be observed in other aquatic plants. The broad, arrow-head shaped ones are grown above the surface of the water, where they are exposed to the air, and can assimilate from it the maximum amount of carbonic acid, as well as release the greatest amount of oxygen. These leaves are shiny and more or less thick and tough; they also endure should the water dry up where the plant is growing. Now those below the surface of the water are like long, narrow ribbons, so formed in order that the river current may not destroy or even mutilate



THE SNOW FLAKES OF THE MARSH LANDS AND RIVER BANKS

In shallow water and muddy tracts, this, the Broad-leaved Arrow-head (*Sagittaria latifolia*) flourishes, in its chosen localities, from the sub-polar regions to the Rio Grande and the Mexican boundary westward. As we flounder through a marsh where thousands of its kind grow in crowded masses, we are sure to be struck by its glistening white flowers, with their brilliant golden centers, as they peep out here and there among the army of broad, sagittate leaves that surround them upon all sides.



ONE OF THE MOST GLORIOUS FLOWERS IN ALL NATURE

The Pond Lily or Sweet-scented Water Lily (*Castalia odorata*) is known to nearly everyone, not only throughout America but in the Old World. It blooms all summer long in many localities, being a plant confined to ponds, lakes, and sometimes to rivers without a perceptible current. The picture here given is from a steel engraving of one of the late Dr. Robert Collett's superb series, copied from one of his remarkable photographs made in Norway, where this plant is also found.

them; which it would be likely to do were they like the ones above the surface. These long, delicate, subaquatic leaves are also exposed to the air contained in the water, and so perform a similar function with respect to giving off carbonic acid and the absorption of oxygen. When the water dries up, as often happens during long, dry summers, these latter leaves shrivel up and entirely disappear. In fact, such plants must be amphibious although stationary, and be able to *breathe* as an aquatic plant as well as a terrestrial one. Wonderful indeed are the results that have come about since the time plants first appeared on this planet, and similar marvelous changes are still in progress upon every hand. To understand most of these we must needs study—industriously and intelligently—all the thousands upon thousands of fossil plants that science has collected and classified.

Writing about the arrow-head, Alice Lounsberry quaintly remarks: "The demure arrow-heads are surely the Quakers of the flower-world; and that they do not

condone frivolity, we may gather from the way in which they keep their pistillate and staminate members apart. The pistillate ones also deck themselves in very seemly little petals that fall early and do not vie in comeliness with those of the staminate blossoms. It hardly seems possible that one of these little under-flowers would ever have the courage to call out boldly: 'Joseph, thou art keeping the sunshine from falling upon my head.'"

All through the Gulf States is a fine region in which to study aquatic plants. In the country about New Orleans, some of the big, stagnant ponds are good places in which to study the lilies, the wonderful growth of grasses and sedges, and plants that flourish in wet places generally. As one passes from pond to pond in the summer time, remarkable flowers may be collected, and no end of interesting animal forms observed. Among the latter we may note thousands of specimens of the big, black lubber grasshopper, of which insect a reproduction of a photograph is here presented. As throughout all the eastern part of the United States and westward, we meet,



IN THE HEART OF A MARYLAND SWAMP

It is in the water and deep mud of such a place as is here shown that our Broad-leaved Arrow-head flourishes in all its glory; it is associated with Cat-tails, Monkey-flowers, Pink Milkweed, Cone-flower, Bind-weed, Common Dodder, and many other marsh and aquatic plants.

along the sluggish streams and in standing water generally, the very abundant cow lily or Yellow Water Lily, of which a cut is likewise given. The specimen shown, however, was collected at Warwick, Virginia, where the plant is very abundant along the shores of the Potomac River. It grows in dense masses, filling up extensive inlets and marshes connected with the stream; it is associated with species of arum and other aquatic plants. Chester A. Reed, in his very useful little "Flower-Guide," says of it that it "is not unattractive, and is interesting in its makeup. The leaves are thick, rough, ovate, slit or lobed to the stem, which is long and hollow. The flower is raised above the surface of the water on a long hollow stem. What appears to be six large green and yellow petals, are in reality sepals; the real petals are numerous, stamen-like, inserted with the very numerous stamens under the golden-yellow rayed disk that forms the stigma." (P. 66.) Some people call them "frog-lilies" because they flourish best in big ponds with muddy bottoms. Our English friends have named them "brandy-bottles;" but for what reason it would be hard to say, as there seems to be nothing in their odor, their general appearance, or in the form of their fruit that would suggest such an object as a bottle—especially a brandy bottle. The country folk in England say, when they smell this lily they are reminded of the odor of an empty

brandy bottle that originally contained that liquor. Strange notions some people have! In any event, the odor is not a very pleasant one; but this may be forgiven for the sake of the memory of the many boating-trips on the ponds which it revives.

In the yellow pond lily cross-fertilization is effected, as in so many other plants, through the agency of insects, they being attracted by the highly colored sepals. Some small beetles (*Donacia*), and various species of bees and flies are also attracted to these flowers, and assist in the perpetuation of the species. Besides *N. advena*, the one here being described, Gray gives two other forms of the plant, namely *I. microphylla* and *N. sagittifolia*, with a questionable hybrid, *N. rubrodiscalis*, all being found in the eastern part of the United States.

In their usual poetic vein, Ellen Miller and Margaret



THE GREEN SPATHES OF THE ARROW ARUM

This very abundant and stately plant flourishes in swamps, ponds, and along the banks of slow-running rivers all over the eastern part of the United States. Many know it as the Green Arrow Arum (*Peltandra virginica*), its dark green, glossy leaves being of enormous size, the plant itself often attaining a height of upwards of five feet or more. Sometimes they occur in masses of several acres, and are generally rooted in soft, deep mud, some of the shorter plants occasionally growing on the adjacent dry short line; they are then less luxuriant.

Christine Whiting say, in their "Wild Flowers," that this yellow pond lily is "a flower of primitive type; the combination of yellow and red in the star design of the pistil is suggestive of Egyptian color and design." (P. 36.) Mathews notes that "On the first opening of the flower there is a triangular orifice over the stigma, so small that an entering insect must touch the stigma. On the following day the flower expands fully and the anthers beneath the stigma unfold, spread outward, and expose their pollen. Cross-fertilization is thus insured and is generally effected by means of the bees of the genus *Halictus*, and the beetle named *Donacia piscatrix*, as has been announced by Professor Robertson.

Our Water Lily family (*Nymphaeaceae*) contains besides the Yellow Pond Lily just described a number of other very beautiful or very interesting aquatic plants. None of these are better known or more generally admired than the common Water Lily or Water Nymph, of which fine examples are here shown in one of the accompanying cuts. Three other genera make up the group, insofar as our United States flora is concerned. These are the Water Chinquapin (*Nelumbo lutea*), also called the Yellow Nelumbo; the Water Shield (*Brasenia schreibeii*), and finally the Cabomba (*C. caroliniana*), a pond plant found from southern Illinois to Florida and Texas.

No species of all these can compare with the White Water Lily. As elsewhere pointed out, this superb aquatic species, with its great, white flowers, has almost a cosmopolitan range in the temperate belt of the Northern Hemisphere. Many gorgeous varieties have been bred from it, and these, from white to the darkest shades, run through many yellows and reds of every conceivable



VIEW IN THE MARSH NEAR SOMERSET, MARYLAND

Here is where you find the Cat-tails and Broad-leaved Arrow-head growing in the greatest luxuriance. Many aquatic ferns and other water plants are profusely mingled with them, while the trees beyond mark the limitations of the swampy area.



AN ANOMALY IN A MARSH PLANT

As a rare coincidence, we sometimes meet with double cat-tails. Here is one that was collected in Washington during the summer of 1915. Two beautiful Monarch butterflies are resting upon these pistillate flower-heads. Note how thoroughly their markings agree; there is no doubt about their being of the same species (*Anosia plexippus*).

tint. Some of their forms, too, are extremely unique, and many fetch high prices in the flower markets of the world.

After all is said, however, none of these fancy varieties—they are all very unstable varieties—appeal to us like the pure white common one of our lakes and ponds. "To my mind," says Reed, "it leads all other flowers in beauty, grace, purity and fragrance. It is composed of four sepals, greenish on the outside and whitish within, and numerous pure, waxy-white petals. They sometimes are gigantic in size, often spreading five or six inches across."

Neltje Blanchan, too, breaks forth in raptures when she begins to write about this very same White Water Lily of our ponds—thus: "Sumptuous queen of our native aquatic

plants of the royal family to which the gigantic *Victoria regia* of Brazil belongs, and all the lovely rose, lavender, blue, and golden exotic water lilies in the fountains of our city parks, to her man, beast and insect pay grateful homage. In Egypt, China, India, Japan, Persia and Asiatic Russia, how many millions have bent their heads in adoration of her relative, the sacred lotus! From its center Brahma came forth; Buddha, too, whose symbol is the lotus, first appeared floating on the mystic flower (*Nelumbo melumbo*, formerly *Nelumbium speciosum*)."

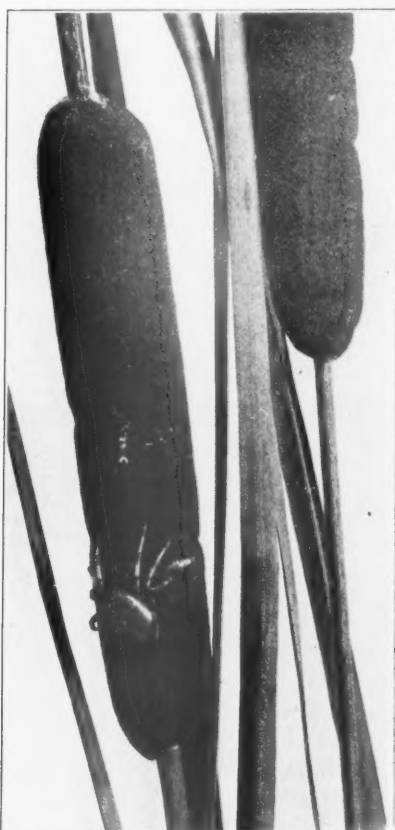
White lilies in nature close up all night, and open a short time after sunrise, when they load the air with their delicious fragrance; again they close up from noon on till eventide.

For many years a controversy has been indulged in, often at a lively rate, among botanists, as to the correct interpretation of the metamorphosis of the stamens and petals of this white lily, and it still seems to be a mooted question even at this late day. Some claim that

certain of its petals are developed from its stamens, while others entertain the very opposite opinion. The stem to the flower is sometimes of very considerable length and very red, while the round, semi-heart-shaped leaves float flat upon the surface of the water, where they expose their entire upper surfaces to the air — a most necessary provision. See the little puddles of rain that have formed upon them in Professor Collett's magnificent picture here reproduced in one of the cuts.

Water lilies are fertilized by numerous aquatic insects, as well as by bees and various species of beetles. The stamens and anthers are of a golden color and arranged concentrically. In the winter these lilies sink to the bottom of the places where they grow, and hide in the mud until the return of warm weather; it was from this fact that they gained the name of Water Nymph. During chilly evenings, it is said, they will also disappear under the surface of the water, and not reappear until the morning sun once more warms up the cool air. If you look sharp, you will sometimes meet with specimens in which the waxy, white petals are tinted pink; the plant may also present other anomalies in its makeup.

One of the most conspicuous plants that we have



ONE OF THE MOST DECORATIVE OF ALL WATER PLANTS

The Cat-tail Flags belong in the genus *Typha* of the Bur-Reed family (*Sparganiaceae*). There are two species of them in our country, they being the Common Cat-tail here shown, which is found throughout temperate North America, and *Typha angustifolia*, a narrow-leaved form, which is found near the coast and not further South than North Carolina.



AN ELEGANT GROUP OF PITCHER PLANT FLOWERS

This gives a perfect flower, front view, and next in height to the tallest specimen, which is commencing to go to seed. It will be noted that the form of the granulated capsule varies considerably. The seed pod is well shown in a specimen on the left, and the appearance of the back of the flower is seen in the center of the illustration. Some call this the Side-saddle flower, but for what reason is hard to say. Others have applied the name of Huntsman's Cup to it, though no well-informed huntsman ever drank out of one of them; as a rule, huntsmen do not relish stagnant water, full of dead insects, nor drink out of a half-washed cup that once contained such a mixture.

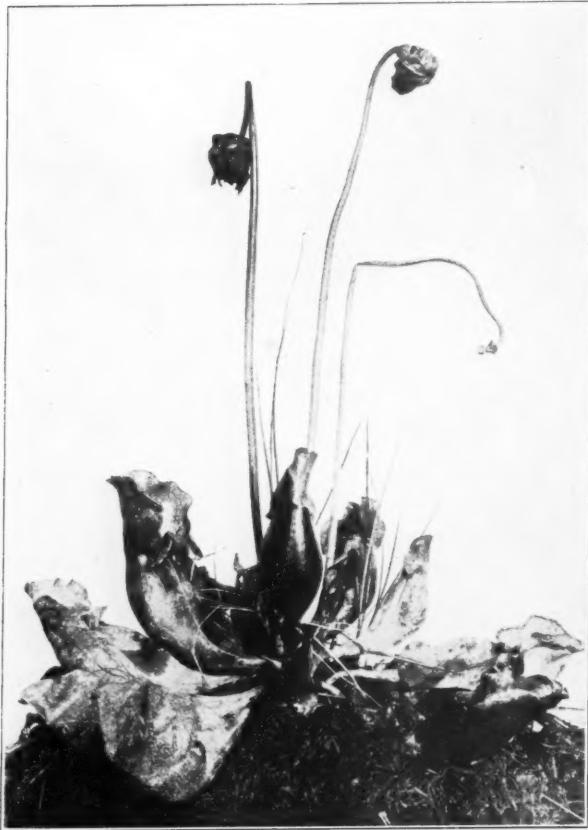
growth known as the Green Arrow-arum; its leaves may be at least two and a half feet in length, and the spathes—three of which are shown in the cut—are over a foot long. They are of a dark, glossy green color, and yellowish along the fluted margins of their slit-like openings. Upon studying one of these, it is to be noted that it forms a sheath snugly enfolding the spadix within. On this latter grow the inconspicuous florets, which are both pistillate and staminate. Flies passing up and down over these effect fertilization. Later on the green berries appear, and soon after the stalk bearing them curves over, to such an extent that its distal pointed end is forced into the mud in which the plant grows. Here its decaying structure acts as a fertilizer for the germinating seeds, and the species is thus perpetuated.

Coming to the extremely curious and most remarkable pitcher plant, it may be said that scant justice could be done it in the remaining paragraphs of this article; and, as a matter of fact, it is intended to devote an entire contribution to its history later on. For the present, the two illustrations here presented must suffice until another day, when more reproductions of photographs will be in order, with a full account of its unusual flowers; its still more unique leaves; its range and flowering season; its habitat and allies, indeed, its entire history will be dwelt upon in detail and with all the fulness that it most surely deserves.

In many marshes, and in shallow ponds with soft, muddy bottoms, there grows, throughout North America, the picturesque cat-tail, of which there are two species in the United States—that is, the Common Cat-tail (*Typha latifolia*), and the Narrow-leaved Cat-tail (*Typha angustifolia*), found only

from southern Maine to North Carolina and westward.

In favorable localities the common cat-tail may grow to become nearly nine feet in height, the ribbon-like leaves passing beyond, or rather above, the russet brown



ONE OF THE MOST CURIOUS PLANTS IN AMERICA

This is the far famed Pitcher Plant (*Sarracenia purpurea*), which has claimed the attention of writers and others for nearly two centuries. It is named for Dr. Michel Sarrasin, who first sent specimens of it to Europe. He was a physician at the Court of Quebec in the early days of the eighteenth century. This will account for his not having sent the Southern form of the plant (*S. flava*), which flourishes in the bogs of Virginia and southward, usually flowering in early April. The flowers of the plant here shown are on the wane, while perfect ones are presented in another cut below. Another pitcher plant is found in the swamps in certain parts of Guiana, South America.

flower-heads. These latter have both staminate and pistillate elements upon them; and, curiously enough, not possessing either petals or the ordinary parts of a true flower, they are quite independent of fertilization by insects. In the cuts here given, the upper part of the flower-spike is not shown—that is, not fully; it is only in the double specimen that its stem is, in part, seen above. Stamens occur only in the superior part or half, while the inferior moiety consists of the pistils; these are the flowers that are fertilized by the yellow pollen falling upon them from above. What we are most familiar with are the cylindrical, light snuff-brown heads, which appear along in August and September (see cuts). One of these is composed of a densely packed down, made up of the pistillate flowers which are bractless. The remainder of the flower essentials have withered and blown away long ago. Specimens of these elegant, pistillate parts may be over an inch in transverse diameter and nearly a foot in length.

Sometimes cat-tail swamps are of great extent, covering acres of marshy, or rather muddy shores of slow-running rivers and inland bodies of water. As plants, they seem to be just as well suited to salt water as to fresh, and they thrive growing in either. Fifty or more years ago there was an extensive cat-tail growth in a salt water marsh, in an inlet not far from the steamboat landing at Stamford, Connecticut. In those days our common barn swallow was extremely abundant, and at nightfall a great many thousands of those birds used to roost on the leaves and heads of the cat-tails in that marsh, sometimes in such immense numbers as to crush down the plants in masses. Many other kinds of birds delight in making their homes in the cat-tail swamps, and most of the species build their nests and rear their young there. Among these species we are familiar with the several species of rails and bitterns; the red-wing blackbirds, and various species of sparrows; the different kinds of rails and coots; the cute marsh wrens, which build curious ovoid nests; and sometimes a short-eared owl and a pair of marsh hawks.

AT the recent annual meeting of the Landowners' Co-operative Forestry Society in Edinburgh, Sir John Maxwell made an address in which he stated that the war has brought about a considerable change in the public attitude toward forestry. With large tracts of woodlands throughout the country being swept clear of their trees the importance of the whole question is being brought home to the public as never before. Sir John Maxwell pointed out that the cutting of trees should be fairly distributed over the country and that poor and understocked woods should be utilized in preference to flourishing plantations which are entering their period of most rapid increment and which will be needed for the period of reconstruction. The work of the Landowners' Co-operative Forestry Society is along the line of far-sighted organization of effort and resources, both as to cutting and planting.

AS an interesting example of the problems which a forester has to work out, it is said that forest officials in India have undertaken to girdle undesirable trees in order to kill them off and give more room to the Deodar and other valuable species. Himalayan bears, however, have discovered that the sap from these girdled trees is sweet and toothsome and have undertaken some girdling on their own hook. They have caused a good deal of trouble because they do not confine their operations to undesirable trees.

SHIRLEY W. ALLEN, of the Extension Department of the New York State College of Forestry at Syracuse University, has been appointed, temporarily, to succeed Victor A. Beede as secretary of the New York State Forestry Association. Mr. Beede has gone into forest fire insurance work at Portsmouth.

SELECTING NUT TREES FOR PLANTING

By C. A. REED

Nut Culturist, United States Department of Agriculture

IN the planting of trees for most purposes, it is now possible to exercise practically the same degree of choice with regard to special fitness as is employed in the selection of men for positions or tools for a piece of work. The fruit grower in every part of the country has his special species and pomological varieties from which to choose. The foresters and landscape gardeners have their species and botanical varieties or improved strains to pick from.

Among the important purposes for which trees are planted, the production of native nuts is singularly behind. The leading species of native nut-bearing trees include the hickories, the walnuts, the chestnuts, the pines, and the beech. Of these, one of the hickories, the pecan, is the only species which has so far been developed by cultivation as to become of importance for the production of an orchard product.

The timber of the pecan is less valuable than is that of most other hickories and is in commercial use only as second-class material. However, it is the most important species of nut-bearing tree in the United States. Its native and introduced range includes the fertile lands of the plains of practically the entire southeastern quarter of the country. It is neither an upland nor a wet land tree. It is not found in the mountainous sections, nor, to any important extent, south of Middle Florida.

Several of the accompanying photographs illustrate the beauty of pecan trees both individually and in orchard or highway avenues. The immense size of one tree illustrated proves that under favorable conditions the pecan is one of the largest growers of any species east of the Rocky Mountains. It also suggests the great age which it may attain. When photographed in 1909 this particular tree measured 18 feet 3 inches in circumference at breast height. It was situated near the Mississippi River, at Hohen Solms, Louisiana, twenty-eight miles south of Baton Rouge.

With very few exceptions there are no named pomological varieties of any other native nut now being propagated. So far as these exceptions are concerned, it is probable that fewer than one hundred budded or grafted trees of such varieties are yet of bearing age, and of such as have attained the age at which fruit might be expected, exceedingly few have borne in paying quantities for any number of consecutive years. Therefore, with reference to the planting of native nut species for profit, the truth of the situation is simply this: In the ordinary course of events, with the exception of the pecan, years of experimentation in the testing of varieties and in a study of their cultural requirements must be gone through before any native species of nut-bearing trees can be planted in any part of the United States with a



A BEARING ORCHARD OF PERSIAN (ENGLISH) WALNUT TREES

The trees in this orchard in Bucks County, Pennsylvania, are thrifty, seemingly entirely hardy where situated, and as a whole are fairly productive. Being seedlings they vary greatly in varietal characteristics; some bear heavily while others yield very light crops; the nuts of some are quite desirable, but from others they are of little value. Trees of this species should be budded or grafted on some hardy stock. Just now the American black walnut (*J. nigra*) is believed to be the most generally desirable as such stock.

certainty of commercial return from nuts alone which would be comparable with that of many other crops which already are upon a well-established commercial basis in the same parts of the country.

With reference to two of the foreign species of nuts which have been introduced, the situation is quite differ-

neither species can yet be recommended for general planting.

The proper place for such partially improved species, as are most of the native nut producers at the present time, is that in which they may be used for more than the single purpose of nut production. Most of the species of the botanical family *Juglandaceae* to which the walnuts and hickories belong, are slow growers, and as such, are objectionable to the average planter. In answer to this, it may be said that among trees, slowness of growth is invariably associated with longevity of tree and its value when cut as timber. Also, when due pains are taken, it is possible to select species which are ex-



A MONSTER PECAN TREE

This tree, growing in the rich alluvial soil of Louisiana, near the banks of the Mississippi River, thirty miles south of Baton Rouge, measured 18 feet 3 inches in circumference at breast height when photographed in 1909. The size and condition of this tree and of hundreds of others of nearly equal size in the same section should dispel any fears that the species is not long-lived, or that it is not a large grower. A larger tree, measuring 23 feet 9 inches in circumference at breast height, was photographed near Webbers Falls, Oklahoma, in 1909. Avenues of such trees along the Lincoln Highway would be exceedingly impressive and appropriate.

ent. In order of commercial importance of the nuts now grown in this country, two foreign species, the Persian (English) walnut and the almond stand second and third, respectively, the pecan, which is an American species only, being first. With these exceptions, the foreign introductions are all in the experimental or test stage, and while possibly the European hazel (filbert) may now be making a strong bid for commercial recognition in the northwest, and the pistache in parts of California,



CALIFORNIA BLACK WALNUT

These trees are used for street planting on the Pacific Coast. This species is of little value for nut producing purposes, but is very valuable for its timber. It makes an excellent stock upon which to graft the Persian walnut. So long as nut trees are in a healthy condition they are not necessarily too large for top-working.

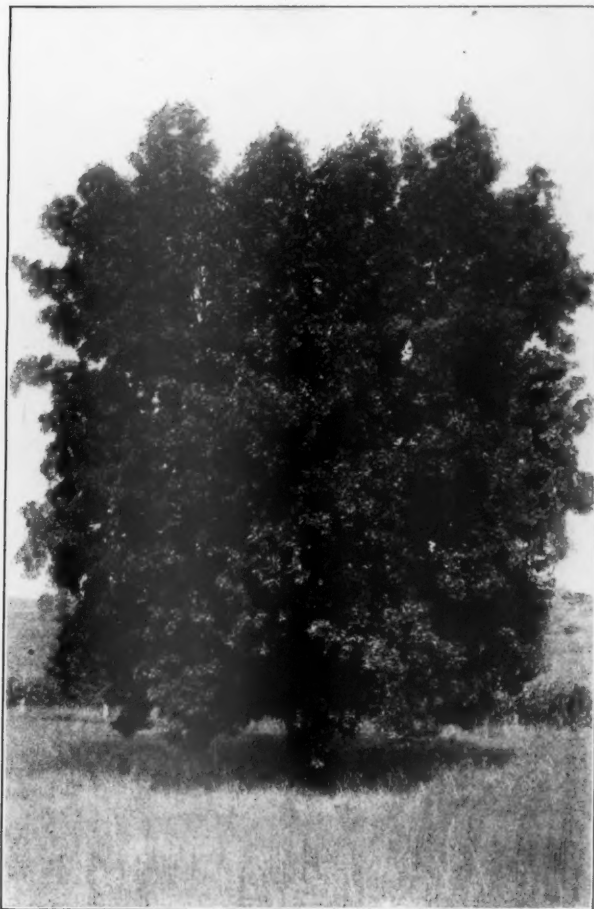
ceedingly satisfactory in the landscape. Several of the accompanying photographs illustrate the individual beauty of selected nut trees and some show their effective use in the landscape.

Foresters are now advocating the planting of trees in

waste places in the country, especially about farm buildings. There are, perhaps, no conspicuous waste places with a greater aggregate area than the strips along the public highway. In certain foreign countries, the highways are planted to fruit trees and the right of harvest awarded to the highest bidder. The revenue so obtained goes a long way toward keeping the highways in good condition. It is possible that this practice may sometime be introduced into the United States, but until public sentiment is radically changed the planting of fruit trees along the highways cannot be expected to yield any satisfactory returns to the public. The experience of Dr. Robert T. Morris, of New York City, who planted cherry trees along the public road past his farm in Connecticut, is typical of what under present conditions might be expected in any part of the country. When the cherries were ripe, automobile parties came for many miles to pick the fruit, and when that in the highway was gone, the cherries from the nearby orchard were taken. In both cases, the branches were broken down and the

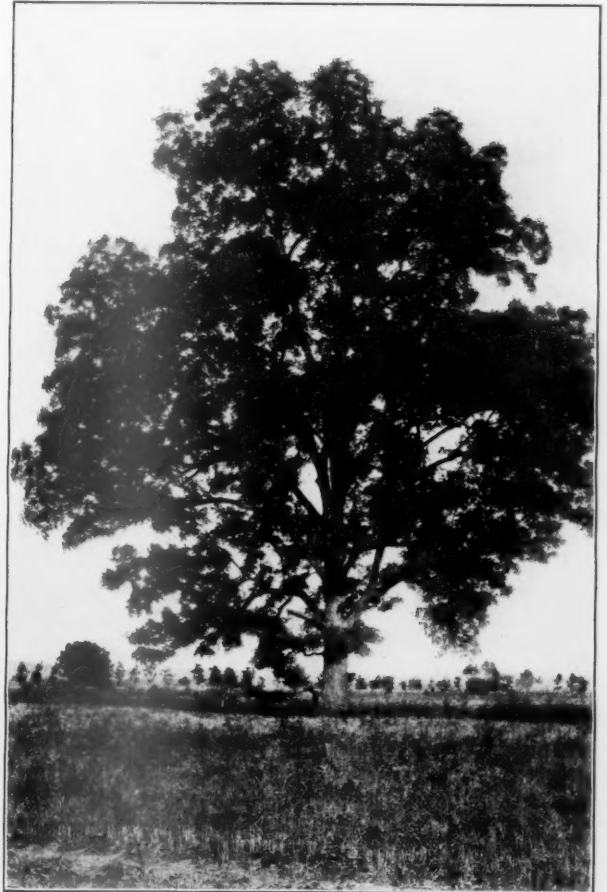
trees left in badly mangled condition. Dr. Morris then tried nursery-grown and expensive evergreens, but on Sundays, automobile parties came again with spades and shovels and dug up the trees.

The ratio of population to tillable land in this coun-



A PIGNUT HICKORY

The hickories are not commonly looked upon as belonging to the ornamental group, but for density and luxuriance of foliage, symmetry of form, and general beauty, it would be difficult to imagine a more perfect specimen than is this tree. The hickories are commonly regarded as being slow growers, but they are quite lasting and valuable when once mature. The nuts of this species often compare favorably with those of the shagbark hickory in character of kernel. This is one of the hardiest of the hickories, and altogether should make one of the most valuable trees for highway and home planting beyond the range of the pecan.



THE PARENT TREE OF THE BUTTERICK VARIETY OF PECAN

This tree is situated on the Illinois side of the Wabash River, northwest of Evansville, Indiana, at a latitude slightly less than that of Washington, D. C. This tree is typical of the pecan species as it is found in nature near its northern limits. It and other varieties originating in the same general section bear bountiful crops of choice nuts. Farther north pecan trees make good tree growth but are uncertain as to bearing. As far as can be seen there is no reason why the pecans should not wisely be planted along the highways and about the home grounds as far north as Southern Michigan and New York State. Occasionally, crops of nuts might be expected from even the most northern planted trees. In middle Indiana and Ohio trees should do somewhat better, bearing not infrequently. In Southern Indiana and other sections of fairly comparable climatic and soil conditions, especially along the Atlantic Coast from the District of Columbia to New Jersey, there is no apparent reason why this should not become one of the most commonly planted shade and ornamental trees.

try is not such that, for a long time to come, the American people as a whole will be pressed into the using of highway land for the production of crops or into respecting the right of the public to harvest such crops as might be grown in its highways. Therefore, for the present, except in densely populated or in more than ordinarily well regulated communities, it would be useless to advocate the planting of ordinary fruit trees along the public roadways.

Irrespective of the possible value of their crops, fruit



NATIVE PECAN TREES IN A MEADOW

These give shade for stock and yield a nut crop at the same time. Not infrequently such trees bear a bushel or more of nuts worth at least ten cents a pound, or a minimum of \$4.00 a bushel. It is not unusual for single trees in the open to yield two bushels or more of nuts which readily bring twelve to fifteen cents a pound.

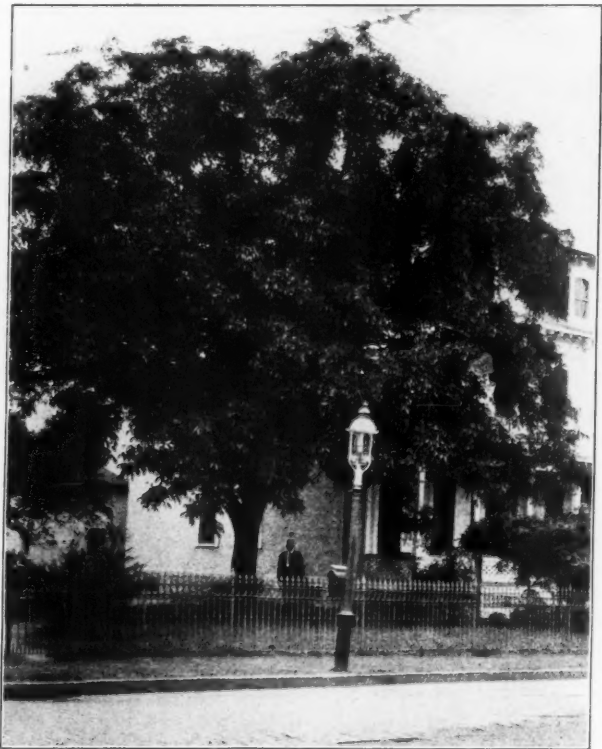
trees of most species are both too small and too short-lived to be suitable for highway planting. With nut trees, the situation is entirely different. The native walnuts, most species of hickories and the American beech are large-growing and long-lived trees. In addition, they are capable of withstanding severe temperatures; they are tough and strong and not liable to injury by storm or while being climbed by ordinary persons; and they readily adapt themselves to a wide range of soil, moisture and climatic conditions.

Ordinary species of nut trees cannot be recommended for the dual purpose of timber and nut production, as, for the former purpose, the trees should be planted close together in order to induce length and straightness of trunk with a minimum of top or bearing surface, while for the latter, they should be planted in the open and given space for the maximum development of bearing surface and a minimum length of trunk. The great demand for hickory in the making of axles, wheels and other vehicle parts and handles for tools, and for walnut in the manufacture of furniture and gun stocks makes it not only possible but common practice to use these woods in short lengths. Therefore, both species planted along the highways and in other waste places might profitably be converted into timber upon reaching maturity, if their crops of nuts should prove to be of small commercial value.

The butternut, *J. cinerea*, is less a symmetrical grower than are the black walnuts. The timber is less valuable and the nuts are cracked with greater difficulty. Nevertheless, it is the most hardy of any native species of *Juglans*. Its kernels are rich in quality and of a flavor more pleasing to some persons than that of any other nut. Cracking the native butternut and marketing the

kernels affords the rural people in many sections a fairly profitable means of employment during the winter months. Its native range extends farther north than does that of either the eastern black walnut or the shagbark hickory, *Hicoria ovata*, and is considerably beyond that of the shellbark hickory, *H. laciniata*. Therefore, in view of its hardiness, and the merit of its kernels, it is well worthy of consideration for planting in the most northern parts of the country.

The black walnut of the Southwest, *J. rupestris* is one of the sturdy, graceful and durable species of that section. The nuts are seldom of sufficient size to be of commercial value. The California black walnuts, *J. californica* and *J. hindsii*, fall into about the same class as does this species in respect to the points mentioned. So far as the planter is concerned, the main differences are those of adaptability to different sections. Under favor-



A PERSIAN (ENGLISH) WALNUT

This particular tree, by a residence on Wisconsin avenue, Washington, D. C., is very satisfactory as a producer of shade and ornamental effect, and in addition, it yields fair crops of nuts. Similar trees are by no means uncommon from Washington northward to Connecticut and west to Southern Michigan.

able conditions of soil, moisture and climatic environment, all are capable of rivaling the eastern black walnut in such points as size, as beauty of tree and in size of crops.

Were it not for the blight which is now making practically a clean sweep of destruction over the eastern states, wherever the native chestnut is found, the American chestnut *Castanea dentata* would certainly be entitled to leading consideration as a highway and ornamental tree. Unaffected by blight or other disease, it is one of the largest growing and most graceful species in the eastern United States. The European chestnut is nearly as susceptible to this blight as is the American species. The chestnuts from eastern Asia now appear to be sufficiently immune to offer a practical solution to the situation by their introduction into this country. However, they commonly lack the sweet agreeable flavor of the American species and need hybridizing in order to improve their quality. This the Federal Department of Agriculture is now doing, and in due time there may be something to offer in ample quantity which will make a satisfactory substitute for the native species. Exclusive of the Asiatic species and the government hybrids, there are now no available species which can be recommended for planting in the blight affected area, and these should be planted only for test purposes.

The pines referred to at the outset of this article as being important nut producers are all western species found only on the mountains and nowhere under cultivation. There are at least fourteen species. Representatives are found in most of the Rocky Mountain states. The most important species is *Pinus edulis*. It is found at altitudes of from five to seven thousand feet in the mountains of New Mexico, Arizona and northern Mexico. In favorable years, the seeds are gathered in enormous quantities under the name of "pinons," or according to the Mexicans, "pinyonies." The nuts are rich in flavor, but small and difficult to extract from the shells. They are not well known in the eastern market, but in the Southwest they form a highly important article of food for the Indians and Mexicans. These pines are exceedingly slow growers and not of graceful form. They could scarcely be considered for highway planting, except at the altitudes to which they are common, and then, probably, only where some more satisfactory shade trees would not succeed.

Among all American species of trees, it is probable that in a combination of beauty, longevity, strength and hardness, the American beech *Fagus grandifolia* is unexcelled. Although commonly looked upon as being a northern species, its range extends south to northern Florida and west to the Trinity River, in Texas. It is most familiar as a clean-barked, spreading tree, with low head, and a height of from fifty to sixty feet. However, its form depends largely upon environment. The writer has seen it in the bottoms of southwestern Georgia, in common with the magnolia, growing to a height of from seventy-five to one hundred feet and with trunks of two feet in diameter extending upward in a manner which, with regard to height and uniformity of size, com-

pared favorably with the long-leaf Georgia pine. The nuts of the beech are rich in quality and of excellent flavor, but owing to their small size and the great difficulty attending the extraction of the kernels, they are not ranked as being of direct importance for human food.



A TYPICAL NATIVE BLACK WALNUT

This species is one of the most rapid growing of any of the native timber producing trees. Its range has been extended until it now covers practically the entire United States with the exception of the sections representing the extremes of latitude, altitude, moisture and dryness. It is very useful in the landscape, and in the number of bushels of nuts produced it was the leading species of the country when the last census was taken.

Their principal use in this country is as a mast crop for turkeys and swine, for which they serve a most useful purpose. Crops which can be used in this manner to good advantage, thus practically obviating the problems of harvesting, storing and marketing, are certainly well worth thinking about in these days of labor scarcity.

There are few large sections of the United States adapted to the growing of trees to which some nut-bearing species is not suited. Most species of nut trees are as capable of producing shade and ornamental effect, and are as hardy and lasting as any others which might be mentioned. In addition, they produce an edible product which is entering into the list of staple food products with great rapidity. The present scarcity of meats and the consequent high prices are compelling the substitution of other products. The superiority of nuts over practically all other products which are available, as substitutes, scarcely needs argument. Already nuts are being pressed into service as rapidly as production permits and perhaps more so than prices and comparative food values justify.

Singularly enough, the oldest and most thickly populated portion of the country and that within which the greatest number of edible species of nuts are indigenous, is today practically without pomological varieties for planting. Within this area individuals have made tests of species and varieties for many generations, yet little progress has resulted. The obvious need is for further test on a large scale. A better opportunity for the making of such a test could scarcely be imagined than that of highway planting.

Pomologists are firmly recommending the exclusiveness of budded or grafted trees. But this advice applies only to orchard planting for purposes of commercial production. Until more and better varieties are known and their merits established, that portion of the country lying north of the pecan belt and east of the Rocky Mountains must await the development and trial of new varieties. Seedlings must be planted in large numbers from which to select varieties. The process is too slow and the percentage of varieties which may be expected to be worth while too small for it to be possible for the individual to make much headway during an ordinary lifetime. Our present system of national highways by which all parts of the country are being connected is perfecting the opportunity. The general planting along these great national highways of elm, oak, poplar, tulip, cedar, hemlock, magnolia, pine or any other species which, unless cut, are capable of producing no crop other than that of shade, would hardly be in keeping with the present need for utility. It would be giving a questionable degree of thought to the welfare of future generations.

To the list of nut trees as utility trees there might be added the sugar maple, and certain species of prolific-bearing oaks. The former could be drawn upon for the making of syrup and sugar, and the acorns from the latter could be put to good use as hog and turkey feed. In wet sections, willows might prove useful from which to cut material for furniture or tying bundles.

A way of overcoming the objection of slow growth of some of the nut species might be the alternate planting of quick-growing species which would furnish shade in a minimum length of time and which could be cut for pulp or other purposes by the time the nut trees reach maturity.

A practical objection to highway planting of nut trees is that unless cared for, such trees are in danger of becoming breeding places for disease and insect pests which would quickly spread to nearby orchards. However, such planting in numbers too small to be worth caring for is not to be considered. Already the country is agreed that the maintaining of the middle of the road in such condition that it can render maximum service is a paying investment. The suggestion here made is only as the next step in highway investment. It is a proposition to make more comfortable and attractive the present system of roadways, and at the same time to help develop new varieties of nut trees for orchard planting. Unless new varieties are soon to become available, a large part of the country will find itself de-

pendent upon outside sources for its principal substitute for meat and its main supply of vegetable fats.

A little thought should be able to work out a sound program for the planting of utility trees on practically every highway in this country.

THE TOTEM TREE

By H. E. Zimmerman

A Civil War veteran of Union Springs, New York, made this unique totem tree, which is eighteen feet high and six feet in circumference. Thirty-four figures are



carved on it. Unlike the idea in an Indian totem pole, this was not intended as a family tree. The gentleman made it after his own fancy, spending two summers in decorating it with animals, birds, portraits and other figures. At the top he built cute little bird houses, and to heighten the artistic (?) effect, he painted the objects in a variety of colors.

THE THRUSHES

(Family Turdidae)

By A. A. ALLEN

Assistant Ornithologist, Cornell University

IN the noisy parks and gardens of the large cities, in the silent spruces of the mountains, from the steaming forests of the equator to the rocky coasts of the Arctic Sea, there is always a bird of the thrush family to welcome the traveler. In the cities it is the robin, the bluebird and the wood-thrush; in the woodlands, the veery, the hermit and the olive-backed species; in the far north, the wheatears, and in the tropics the solitaires and the "thrush-robins." When we make the term thrush broad enough to include the ground thrushes, the accentors, the redstarts, the nightingales and the chats, of the Old World, the family includes between five and six hundred species, but of these, only about 240 are true thrushes. These are widely distributed throughout the world, eighty of them being confined to the New World, of which a dozen species are found north of Mexico.

As a family, the thrushes are medium-sized birds, usually under twelve inches in length, with strong wings and legs and with bills slightly notched near the tip and supplied with strong bristles at the base. They are uniformly colored, rather than streaked, the majority brownish or grayish, although blues, yellows, or even reds are found in the plumages of some. The underparts are white or at least lighter than the backs and, in typical species, are more or less spotted. In species having unspotted breasts, the young in their juvenal plumage

show the spots that have been lost by the adults, as with the robin and the bluebird, interesting examples of ontogeny, for the individuals pass through the stages by which the species have progressed in the course of their evolution.

But it is not for the brilliancy of their plumage that the thrushes are noted, it is for the richness and beauty of their songs. The world over, some member of this family surpasses all others in the appeal which it makes to the human ear. In Europe, it is the nightingale, in eastern United States it is the hermit thrush, and in the West it is the solitaire. The wonderful songs of the mockingbird and the thrasher, discussed last month, appeal to us by their marvellous technique, but the songs of the thrushes by their depth of feeling. Listening to the mockingbird, one is thrilled; listening to the hermit thrush, one feels exalted.

Except during the nesting season, the thrushes travel in scattered flocks, frequenting the borders of woodlands but coming into gardens if they can find food. During the spring and summer, this consists almost entirely of insects and worms, but during the late summer and fall, the various wild fruits form an ever increasing percentage. Gardens, where the dogwoods or the Virginia creeper grow, are sure to attract the passing flocks of thrushes in late September or October, and in the South, the mistletoe and holly sustain some species through-



A HOT DAY IN BIRDLAND

The veery is sheltering its young from the hot rays of the sun. The veery can be told from the other thrushes by the fewness and faintness of the spots on its breast.



THE FIRST TIME OUT

Young blackbirds just out of the box—they seem somewhat alarmed at the bigness of the world. Notice the spotted plumage of the young as compared with that of the adult bird.

out the winter. The robin, the bluebird, and the hermit thrush remain in Southeastern United States and the solitaire and the varied thrush in the Southwest, but the veery, the olive-backed, gray-cheeked and the wood



EVERYWHERE A FAVORITE

Except with the gardener, who is unwilling to lose the toll of cherries or berries which is exacted in payment for the insects destroyed at other times of the year. The robin is the commonest bird in the United States and has increased more rapidly than any other native species.

thrush continue their journeys to Central America and Northern South America.

Of all the thrushes the robin is, of course, the best known, but in coloration it is quite an aberrant member of the family. It was christened the "robin" by the early settlers because of its general resemblance to the European robin, although the latter is a much smaller bird. It was probably originally a forest dweller, as it still is in some places, but like its European cousin, it has adapted itself to human occupation of its haunts and now builds its nest wherever it can find a sheltered ledge about the house. Its numbers have increased probably more than those of any other native bird in the United States so that today it is regarded as the most abundant species throughout the country. It is beloved by everyone except the gardener, who is unwilling to lose the toll of cherries, berries or grapes in payment for the insects destroyed at other times of the year. It may well be, however, that as the robin increases and the native fruits give way before the cultivated varieties, the robins will become a great nuisance, for fruit they must have, and with no native fruit to satisfy their appetites, the cultivated varieties must, of necessity, suffer. It is a wise plan, therefore, to make provision for the increase of robins and other thrushes by extensive planting to furnish natural food for them. Not only should individual agriculturists do this, but the States, in planting along highways, in parks and reservations,

should include many trees of mulberry, mountain ash, wild cherry or even the sweet cherry to provide for these beneficial birds, to furnish the much needed fruit, and thus help protect the cultivated varieties in the vicinity.

The nest of the robin and indeed that of most other thrushes is a rather bulky structure made of grasses and straws, lined with finer grasses, and having an inner layer of mud. The band of mud across the breasts of all female robins for a short time in the spring is made when the bird is shaping its nest, for when the nest has been roughly plastered, the bird gets into it, as if to incubate, and then by turning around and around, shapes it and makes it perfectly symmetrical. Three to five blue eggs are laid, which require about two weeks to hatch. The young remain in the nest another two weeks so that inside of a month the nest is again empty and ready for a second brood. The same nest, if in good condition, is used for the second brood and, indeed, if it is in a sheltered spot, again the following spring, merely being repaired with enough new material to make it strong.

When the young are able to shift for themselves, they often congregate every night in large flocks at a common roosting spot, perhaps led by the old males. By fall, these roosts, which are usually in a dense swamp or in a clump of oaks or other thick foliaged trees, are very large, containing thousands of birds.

The immature plumage of the robin, in which the breast is orange-brown spotted with black and the back



NOTICE THE SPOTS

These are young robins and in their juvenal plumage show a color pattern through which the species has passed in its evolution. All true thrushes are spotted in the immature plumage if not in the adult.

brownish-gray spotted with rusty, is worn until September or October, when it is replaced by the plumage of the adult. Males and females are colored alike but it takes several years to acquire the rich chestnut breast

and black head of the adult. Females are inclined to be somewhat duller than males, but this difference is more one of age than of sex, and vigorous, mature females are brighter than young males. The western robin differs from the eastern bird principally in the absence of the white tips to the outer tail feathers.

Another aberrant member of the thrush family is the familiar bluebird. With its blue back and chestnut breast, it is indeed one of the most beautiful birds of the countryside and well worth every effort to increase its numbers. It is quick to respond and in many localities has greatly increased because of the nesting boxes which have been put up for it. Indeed, in most places, it has now regained the numbers lost in the devastating storms of the winter and spring of 1911 and 1912 when thousands were starved and frozen, and is once more a familiar bird. A similar catastrophe occurred also in 1895 when so many were killed that they did not regain their hold for over ten years.

The female bluebird is much duller than the male and the young are grayish, obscurely spotted above and below, and showing blue only in the wings and tail.

The blue eggs, so typical of the thrush family, have, with the bluebird, become very pale, perhaps owing to its hole-nesting habit, for the majority of birds that nest in holes lay pure white eggs.

The most suitable nesting box for the bluebird is one

Both the robin and the bluebird spend the winter in southern United States and are among the first birds to push northward in the spring, arriving in northern



AN EGG IS AN EGG TO A VEERY

The speckled egg, that of the parasitic cowbird, is cared for with equal solicitude to one of its own. The veery nests on or near the ground in moist woodlands.



MORE SPOTS

The wood thrush has more conspicuous spots on its breast than any other thrush in this country. Notice the paper napkins with which this bird has endeavored to disguise its nest—"camouflage" in birdland!

that measures 5x5x8 inches inside with a two-inch hole four inches from the bottom on one side. It is best placed on a pole in the garden or above a fence post, six to ten feet from the ground, in bright sun or light shade.

United States early in March or even in late February. Occasionally individuals of each species find food and shelter and spend the winter in protected spots as far north as New York or New England.

The western bluebird differs from the eastern in having the throat blue, instead of chestnut, and in having a brownish spot on the back. The mountain bluebird of Alaska and the higher Rocky Mountains has the entire underparts light blue, but is quite similar in habits to the other species.

After the robin and bluebird, the next thrush to arrive in the spring, while the leaves are still bare, is the hermit thrush. Being of a retiring disposition and frequenting woodlands rather than gardens, it is less often seen, although during cold wet spells, when food is scarce, they venture close about the house and come to feeding shelves with the chickadees and juncos. The hermit is a typical thrush with uniform dark brown upperparts and whitish underparts with dark spots on the fore breast. The breast is less spotted than that of the wood thrush and more so than that of the veery, and it is easily distinguished from all of them by its rufous tail which it has the habit of lifting slightly when it alights or when it utters its call, a low *chuck*. It nests in the hills and mountains of northern United States and Canada above an altitude of 1,500 feet, placing its nest of mosses and grasses on the ground beneath a sheltering branch.

It is only on its nesting ground that its full song is heard and there usually early in the morning, toward dusk, or even in the dead of night. Then, when the

woodland is silent save for the occasional ecstatic outburst of an ovenbird, hurling itself above the trees, the clear tranquil notes of the hermit will move even the most stolid. Beginning low, like the distant dripping of some cool spring, the singer runs lightly up the scale



A BLUEBIRD IN THE ORCHARD

Bluebirds and apple blossoms are always associated. It is well that they should be—well for us, well for the birds, and well for the orchard.

until it touches the highest chords; a still higher note, a trill, and then silence. Soon the low, liquid notes are heard once more, as the bird moves nearer, and the song is repeated again and again, not hurriedly, but with all the leisure and solemnity that a finished production requires. All nature is hushed and seems to listen to the voice that expresses so well the purity, the serenity, the mystery of the twilight in the forest.

The wood thrush and the veery are but slightly inferior to the hermit in their songs and in most places are much better known, for they often take up their abodes in city parks or about shaded lawns. The veery requires moist woodlands with undergrowth in which to place its nest, but the wood thrush is often content in an orchard or along shaded streets like the robin. The song of the wood thrush is somewhat like that of the hermit, but the phrases are shorter and the notes less clear. The veery's song, on the other hand, is quite different. Rich and clear like the songs of the other thrushes, it consists of a single continuous warble like the syllables, wee-o, wee-o, wee-o, given on a descending spiral. The veery has fewer and less conspicuous spots on its breast than the hermit, but the wood thrush has its clear white breast covered with large dark spots. Moreover, it can be distinguished also by the fact that its head is much brighter than its back. The veery winters in northern South America, but reaches the northern United States the last of April, somewhat earlier than

the wood thrush, although the latter winters from southern Mexico to Central America.

The olive-backed and gray-cheeked thrushes are less well known than the others. Wintering in South America and nesting in the coniferous forests of the North, they are seen in the United States only as transients in the spring and fall, except in the mountains of New York and New England, where they nest at altitudes over 2,500 feet. They are both uniformly darker than the other thrushes and can be distinguished from each other, in good light, by the fact that in the olive-backed, the eye ring and cheeks are washed with buffy. The sub-species of the gray-cheeked thrush which nests south of the St. Lawrence, is somewhat smaller than the northern bird and has been named the Bicknell's thrush.

The Townsend's solitaire of the Rocky Mountain region is similar to the hermit thrush in its habits, living alone in the coniferous forests whose silences are broken only by the beautifully clear notes of this bird. The solitaire is a dark gray bird, about the size of a bluebird, with a white eye ring, white wing bars and white tips to the outer tail feathers. It builds a rough nest under a shelving bank and, unlike the other thrushes, lays grayish-white eggs spotted with brown.

The varied thrush is a strikingly marked bird of the Northwest, ranging in summer from Alaska to the mountains of northern California and wintering from Washington to Lower California. It is a bird about the size of a robin, rusty brown beneath, the throat crossed



AN INSECT ELIMINATOR

A box full of bluebirds will do a great deal toward ridding the garden of pests. The box should measure 5x5x8 inches, with a 2-inch hole four inches from the bottom on one side.

by a blackish necklace, and dark bluish-slate above. It is ordinarily a rather shy bird, but on its winter journeys it frequently comes into gardens where it can find the berries of the California holly or of the manzanita.

EDITORIAL

HOW WE STAND FOR EFFICIENT STATE FORESTRY

AN editorial in *AMERICAN FORESTRY* for June, 1917, stated the facts regarding the recent reorganization of the forestry department of Vermont. It told how the state forester, a capable, experienced man with long recognized ability and a first class reputation as an efficient forester, resigned rather than be legislated out of office. He did so because, like many another good citizen, he found it impossible to serve the best interests of the public and at the same time comply with the wishes of certain influential people of the state.

This frank, straightforward editorial expression regarding a situation, in which Vermont has no monopoly, has inspired some of the newspapers of the state to not only continue their attacks upon the former state forester, but to challenge the integrity and the independence of the American Forestry Association as well as implying that the editorial was published at the behest of the former state forester, who is now employed in the United States Agricultural Department.

Such charges are not in themselves worthy of answer, but they do suggest a further statement clinching the argument which was previously made.

One newspaper says: "It is about time for the head of the Forest Service of the United States, or the Secretary of Agriculture, to tell their underlings to refrain from political activities."

This is amusing in view of the well-known fact that for the past twenty years the American Forestry Association has exerted itself with considerable success in building up and protecting efficient and non-political state forestry departments, in charge of trained experts, who know and understand what forestry is, and who mould and develop a progressive forest policy for the states which employ them.

The Vermont newspapers need not assume that the association has singled out their state for special attention. Far from it. In many states in the last few years efforts have been made to overthrow efficient forestry departments which have become popular and important parts of the state machinery. These efforts have been inspired primarily by selfish motives. The usual method by which control of these efficient departments has been sought has been by reorganization and consolidation with other departments under the guise of economy. The real end sought was the placing of the trained and efficient heads of these forestry departments under political direction and dictation.

Efforts similar to those which succeeded in Vermont

and in Wisconsin have been met and defeated in New Hampshire, Maryland, Minnesota and Oregon and have been prevented in other states by the knowledge that they would be vigorously opposed.

Efficiency in state as well as national government departments, where technical men are required, demands the substitution of the trained executive for the political appointee and the elevation of public service into a career sufficiently stable to attract men of real ability.

It is apparent that neither state nor national forestry can measure up to the demands made upon it without the adoption of a system by which men of merit will be retained without political interference. The National Forest Service has such a system and much of its success is due to it. States, too, must have it if their forestry administrations are to be successful and if they are to give their citizens the kind of state forestry management best suited to their needs.

How shall an efficient, non-political forest administration be supported against the onslaughts of private greed and the hostility of the believers in partisan management? The employees upon whom rest the burden of the work are comparatively helpless to defend themselves against attacks which are based upon the assumption that anything they say is inspired by self interest, and that their real purpose is not so much to serve the public honestly and faithfully as to hold their jobs. The average citizen is still of the opinion that most state jobs are sinecures and that the appointments are made and salaries paid as rewards for political work or influence.

As a matter of fact, men of equal training, education and ability to those required for the successful administration of technical positions under state and national governments can and do command salaries, when in private employ, largely in excess of those paid them in public service.

In calling public attention to the outcome of the struggle in Vermont the *AMERICAN FORESTRY* Magazine published facts of common knowledge and what it did was fully in keeping with the policy of the Association in striving for the best possible forestry administration for every state in the Union. Its utterances were not inspired by any government or state official or by the former forester of Vermont, and it will continue to speak plainly and forcibly in favor of the establishment, continuance and protection of competent and efficient forestry departments, as it has done in the past, with the knowledge that it has the full support of its members and of all who believe in good government.

BUILDING AN ATMOSPHERE OF STABILITY INTO THE HOME

BY RAWSON W. HADDON

A RECENT commission has decided that not more than a fraction of the people of one large American city can be called really native American, and that the rest—nearly ninety per cent of the total population—remain so purely and hopelessly alien that immediate steps were thought necessary to bring this foreign population, or at least some part of it, into touch with our own American ideals in more effective ways than have yet been attempted.

While no statistics are available in the case of our suburban population, carefully arranged figures would probably show the population there less migratory than one might suppose.

It is certain, however, that until very recently the typical suburban house has carried with it no suggestion of stability or permanence. The average house within commuting distance of large cities has been, and still is, in appearance, an extremely haphazard and informal affair, more suggestive of hurried erection than of anything else and entirely lacking in those marks of long residence which one sees, or unconsciously feels, in the recent suburban developments outside of London or other English cities.

The American suburbs are in many instances older than the English ones. It is not a matter of actual occupancy at all, but of architectural design. And while

English architects seem always to have known instinctively how to put into their work a feeling of dignified stability, the ability to put a similar feeling into their designs is one that has but recently been acquired by architects in the United States.

But some of our architects undoubtedly *have* the knack, and it would probably puzzle most visitors to Cranford, New Jersey, to explain why the Bush house, built only a few years ago, possesses so subtle and definite an appearance of age and carries so much more distinct an impression of containing within itself those best traditions of American home life in which its neighbors—even those of undoubtedly greater age—seem most lacking.

The explanation is simple. Mr. Joy Wheeler Dow, the architect of some delightful houses, of which a few have been illustrated in this magazine, has worked out the following explanation which appears in his book, "The American Renaissance."

In an average, modern house of that western type of design which has been widely heralded from time to time as a "new American style" of architecture, Mr. Dow found the following elements suggested:

Moresque Spain.....	10 per cent
Moresque Algiers.....	10 per cent
Moresque California Mission.....	10 per cent
East India	5 per cent
Newly reclaimed land	10 per cent
Chinese Ornament.....	5 per cent
Modern invention, pure	50 per cent

Anglo-Saxon Home

Atmosphere00 per cent

On the other hand, a distinctly homelike looking house of American Renaissance or Colonial design consisted, according to the same analysis, of:

Moresque Spain.....	00 per cent
Moresque Algiers.....	00 per cent
Moresque California	00 per cent

Mission	00 per cent
East India	00 per cent
Newly reclaimed land	00 per cent

Chinese ornament.....	00 per cent
Modern invention, pure	00 per cent

Anglo-Saxon Home

Atmosphere100 per cent

The secret of the Cranford house consists, also, of its possession of that single important



The house of Mr. Charles H. Bush, at Cranford, N. J., looks for all the world as though it might have been put up by one of the "earliest settlers." But it was built only a few years ago. Hollingsworth and Bragdon, Architects.

item, the 100 per cent Anglo-Saxon home atmosphere. And assuming that the house does possess an atmosphere that is a desirable one, the question naturally is, "How was this secured?" This also will be easy, in the present instance, to explain.

For, if you will look back on your own experience, you will probably discover that some one house, one in which you lived or where you visited, and which remains connected most firmly in your mind with the pleasant memories of cheerful home life, was a house somewhere in the country, surrounded by broad fields and great trees—or it may have been a house in a country or suburban village or town surrounded, but to a smaller extent, with the same things.

Certainly, the chances are, it was a frame house, rather large, and there were trees around it and flowers near the walls and down at the road there was a fence. Now, if you are a true American, and possess the memory of that particular house, you may be sure that the memory has been lingering around in your head and has, unknown to you, been standing as your measure of comparison in all your thoughts of what *home* ought to be.

For this reason it will be plain that there is no cause for surprise when you fail to respond to some houses as readily or entirely as you do to others. Or that a grandiose stucco house or an imposing stone one does not measure up to your ideals in the same way that a little white frame house nestled down among autumn tinted leaves and bright flowers will seem to touch certain chords that tell you at very first sight that you *would* be happy in that house, that it would be a home for you and for your children, and—if you look into the matter as far as that (which you should)—a home for your children's children, or at least, some, or one, of them as well, and not simply, as too many houses are, a mere sheltering roof and nothing more.

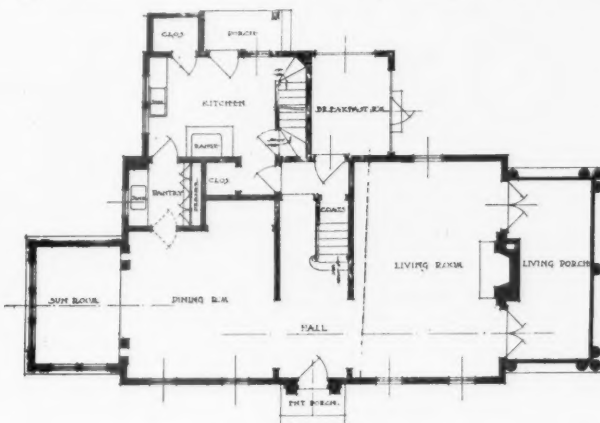
So there are psychological reasons why you, as a real American with a love and respect for good American traditions, must respond to this house in Cranford that I have chosen as an example of how an architect may compel our interest in his work by appealing to mental apparatuses of which we are entirely unconscious.

Our interest, of course, is aroused more by the echo of that house that we knew long ago, but the appeal to it is through the house before us and this house in turn takes on an interest as a "visible memory" of the other one.

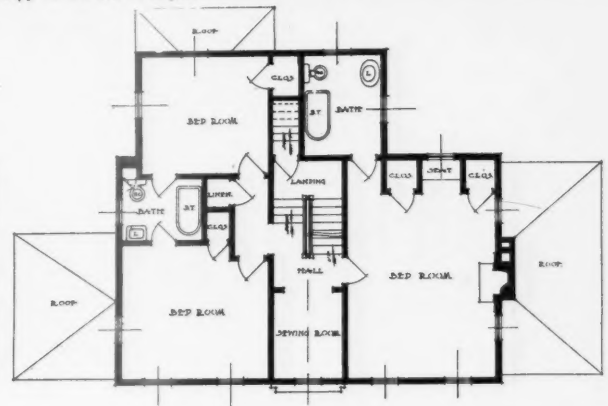
Not by the house alone is the interest brought about, but by it in connection with the other details that the architect has arranged: The trees, for instance, and the hedge, and the dormer windows (to remind us of old-time sport in attics) and chimneys that guarantee fire-places to sit around on winter nights. All these things go to make up the impression and one without the others



A near view of the door shows us that in order to get Colonial atmosphere it is not necessary to go out with a pencil and rule and make an exact copy of an old example.



FIRST FLOOR PLAN.
First Floor Plan, House at Cranford, N. J.
Hollingsworth and Bragdon, Architects.



SECOND FLOOR PLAN.
Second Floor Plan, House at Cranford, N. J.
Hollingsworth and Bragdon, Architects.

would probably appeal to us as little as the stucco house or that "imposing marble mansion" did.

To say that architectural style alone gives the house its atmosphere of stability and of "having-been-lived-in-ness" is as one writer has said, "the veriest punk and rot." Witness the perfectly designed (from an archaeological viewpoint) Colonial houses, or English villas that leave us quite untouched.

One cannot say, for instance, that this Cranford house is Colonial because it has such and such details. You will find none of the favorite Colonial details employed in its making. Rather it is in the elimination of them that the architects have shown their greatest ability. It is that they have made us acknowledge that this house has that "100 per cent Anglo-Saxon home feeling" and not that they have forced us to admire a perfectly designed "Colonial sampler" simply as such or that they have made a design that overwhelms us with its cleverness so that no room is left for consideration of the homelike qualities of the building.

We who belong to the Anglo-Saxon race must bow down to the Latin theory of cities insofar as our business life is concerned. But your true Anglo-Saxon is a country born man with a soul that develops best among trees and fields and flowers and plants.

Naturally, then, the house that suggests these things, and all of them, and the architect who arranges such houses for us, are points toward which we turn in escaping from our life in cities of Latin inspiration.

Therefore, in the final ideal arrangement of our lives, these things are among the necessities to our happiness; a house like the one we knew somewhere a long time ago, a certain number of trees around that house, some flowers, a garden, and a stretch of green, open field or lawn.

In America the house that measures up to our standard is more often a frame one and perhaps, if we were very fortunate in our antecedents, a Colonial frame one.

The Cranford one is Colonial. It is frame. Parenthetically I might add for your information, should you attempt the erection of a similar house, that the clapboards are white pine, the shingles cypress and the frame is spruce.

The grounds are supplied with a certain number of trees, and we have a hedge at the street and flowers and vines in a little strip of garden immediately at the foundation of the house. It is for these reasons that the house interests us and stands out from its neighbors in the possession of that subtle appearance of age and homelikeness.

In your house, if trees are not already grown on the land, they may be transplanted, fully grown, by certain scientific methods of removal and transplantation so that you will not have to wait for years before your shade is an accomplished fact.

I might have added, also (had I not been

too enthusiastically engaged in other interests), that the exterior of the house was painted with especially prepared white lead and linseed oil and that the roof shingles were stained.

You may wonder what the cost of building all this psychological inspiration was. Exclusive of the trees, and gardening, of course, the cost of the house was \$10,000.

You see then, how important to our full enjoyment of life, socially, psychologically and domestically, a proper development and understanding of forestry must be. And how important it is for you, when you build, to have your house designed by an architect who understands it, and who knows the value of white clapboard walls and fences and green trees and shrubs and enough flower garden space to provide just the right amount of bright color—but not too much—to complete the outward representation of the domestic happiness that maintains within.

BOOK REVIEWS

The Development of Forest Law in America, by J. P. Kinney. John Wiley & Sons, Inc., New York.

As chief supervisor of forests, United States Indian Service, Mr. Kinney has been brought into intimate relationship with the forest resources of the country and the great mass of laws pertaining thereto. In this book he has collated a mass of useful information on this subject, the whole comprising a historical presentation of the successive enactments by the Federal Congress and by the legislatures of the states directed to the conservation and administration of forest resources. He has sought to confine himself to a logical presentation of the chronological development of legislation. The field covered includes the preservation of existing resources, the reforestation of cut-over or burned areas and the systematic management of forests for productive purposes. For the sake of completeness he has deemed it wise to include references to a number of laws regarding forest fires, shade trees and other related subjects which were not strictly laws on forest conservation or administration. For convenient reference the author has in most cases given both the date of the individual act cited and the chapter number, and to facilitate a ready finding of the law he has often given the page in the session laws as well. The work is important for all who are in any way interested in forestry laws.

A Nursery Blight of Cedars, by Glenn G. Hahn, Carl Hartley and Roy G. Pierce. Government Printing Office, Washington, D. C.

A Nursery Blight of Cedars is a treatise by Glenn G. Hahn, scientific assistant; Carl Hartley, forest pathologist and Roy G. Pierce, forest assistant, investigations in forest pathology, in the bureau of plant industry of the United States Department of Agriculture. The treatise was originally

published in the *Journal of Agricultural Research* and is republished by authority of the Secretary of Agriculture, with the co-operation of the Association of American Agricultural Colleges and Experiment Stations. It deals with a disease through which nurserymen have for fifteen years lost large quantities of red cedars. To such extent has the damage manifested itself that several of the largest growers have been forced to abandon the raising of trees of this type, despite the fact that the demand for them is sufficient to make their propagation of considerable importance in some of the nurseries of the middle west. The authors of the booklet have conducted extensive experiments in inoculation and treatment of the parasitic growth. The fungus has been obtained from Kansas, Nebraska, Iowa, Illinois and Pennsylvania. Incomplete tests so far made in spraying with commercial lime sulphur solution and Bordeaux mixture have given little indication of value as to control.

Those interested in wood preservation cannot fail to be impressed by a new booklet on "How to Make Farm Timbers Rot-proof," just issued by the Barrett Company. This work treats of the treatment of timbers for general construction purposes, fence posts, shingles and silo staves and foundations and deals with the use of Carbosota creosote oil as a substitute for paint for the checking of decay and because of its qualities for the destruction of germs and insects. Emphasis is placed on the value of creosoted wood for excluding insects and vermin, the eradication of chicken mites in chicken-houses, for keeping ants and spiders away from beehives and for checking the development and spread of disease germs such as those of hog cholera. Detailed discussion is given of the open tank treatment of timbers, the brush treatment, dipping and spraying.

Under the title of "The Sport Alluring," the DuPont Company of Wilmington, Del., has just issued a very attractive book dealing with trapshooting. The book is attractively printed and handsomely illustrated with thirty or more pictures that will be of interest to all sportsmen. In its unfolding of the possibilities of trapshooting the book throws much interesting light on the subject. The book may be had on application.

As a companion to "Handbook of Explosives," the DuPont Company of Wilmington, Del., has issued "The Giant Laborer." This booklet deals entertainingly and completely with the application of explosives to various agricultural and miscellaneous uses. It details the advantages of explosives in land clearing, ditching, drainage work, subsoiling, tree-planting and orchard cultivation. "The Handbook of Explosives" gives full instructions as to the handling of explosives for these and other purposes. Both books may be had on application.

CANADIAN DEPARTMENT

ELLWOOD WILSON, SECRETARY,
CANADIAN SOCIETY OF
FOREST ENGINEERS

On the 31st of August a most interesting meeting took place at Tupper Lake. Dr. Fernow invited a few foresters to met him there and look over the plantations which were made at Axton by the first Cornell Forestry School between 1898 and 1904. A number of Canadian Foresters went down by motor, Clyde Leavitt, C. D. Howe and R. D. Craig of the Dominion Conservation Commission, and Ellwood Wilson of the Laurentide Company. The Cornell forestry students with Professors Spring and Bentley came over from their camp, Professor Bryant of the Yale Forest School and Professor Recknagel, Forester to the Empire State Forest Products Association and Messrs. Gaylord and Stubbs from Nehasane Park together with Dr. Fernow made up the party. The plantations were thoroughly studied and in the evening a discussion of the best methods of handling cut over lands in the Adirondacks took place. The chief lesson to be learned from the work done by Dr. Fernow, is, as seen by the writer, that indiscriminate planting, just for the sake of planting something, is a waste of time and money, whether done by the State or anyone else. The object to be attained should be carefully considered, trees best suited to the soil conditions should be chosen, seed should be carefully selected, only the very best transplants should be used and these should be as large as can be conveniently handled. Considering the length of time needed to produce a crop of timber and the investment involved anything less than a fully stocked area falls short of the end desired. Ragged, uneven sized stands are a waste of time and money. Probably the only way in which results can be hastened is by planting on the largest possible sized and most vigorous stock. British Columbia and western trees do not seem to be worth planting in the east, Norway spruce has shown that it is an excellent tree for fair to good soils and Scotch Pine certainly does splendidly, and for a first crop on poor and burnt over lands and where quick results are desired has no equal. The planting up of the waste and burnt over lands in the Adirondack Preserve should be continued, but on a much larger scale and some planting plan should be developed and put in practice at once.

One of the most interesting developments in Canada is the change in public opinion in regard to its forest resources. A prominent lumberman and senator, who a few years ago pooh-poohed forestry methods as unpractical, and

thought that timber would grow fast enough to reproduce the stand every thirty or fifty years, now declares on the floor of the Senate that Canada has only enough timber to supply the United States for eight years and that our ideas of our timber resources are greatly exaggerated. Paper manufacturers have stated before the Commission at present investigating their business, that they have only pulpwood enough for fifty years more. It is to be hoped that the public and those interested in timber lands will awake completely to the dangers of the situation and will help to improve the systems of fire protection, force the various provincial governments to reorganize their colonization policies and will eliminate the logging wastes and inaugurate practical and rational silvicultural and planting operations. The Dominion Forest Products Laboratory is doing splendid work along these lines, but we need a real forest laboratory in the open, where questions of vital importance to our forest can be studied out. A few of these may be stated. The best ways of logging and utilizing our different forest types, so as to make the most out of them and at the same time to leave them in the best possible condition for the future. How to handle our burnt over areas, what species of trees to plant on different soils and under different conditions. How best to encourage natural reproduction, how to drain and plant our large areas of swamp lands, and how we can most economically transform our wild forests, containing a large admixture of species of no commercial value, into well stocked areas producing the largest possible number of the most valuable trees and at the same time keep our industries dependent on the forest supplied with a sufficient quantity of raw material at a profitable price. These are some of our most important problems and they should be scientifically and systematically attacked by trained men, for the results would be of untold benefit to the whole country.

The Canadian Forestry Association has obtained a very good moving picture film which will be shown at moving picture houses throughout our forested districts. It shows the beginning and progress of a forest fire, the result of carelessness, and the terrible destruction caused by it. The educational campaign of the Association is progressing favorably and is doing a great deal of good.

In British Columbia the season has been a bad one for fires and anxiety still continues. In Spruce Valley ten lives are thought to have been lost and three camps of the Elk Lumber Company, together with large quantities of logs and

supplies, have been wiped out. The Crow's Nest Valley in Alberta also had a bad fire in the district operated by the McLaren Lumber Company. This was promptly taken in hand by Mr. R. M. Brown, the Forest Supervisor, and Mr. E. H. Finlayson, the District Inspector, who managed to keep the fire under control. It is reported that the fires which took place in Northwestern Ontario earlier in the season were much exaggerated. In Quebec, New Brunswick and Nova Scotia only a few insignificant fires have been reported.

At the auction sale of timber limits by the Province of Quebec, several limits were sold at a price of \$400.00 per square mile. These were along the line of the National Transcontinental Railway about 225 miles northwest of Quebec.

The Quebec Forestry Branch has put a party in the field to study the condition and the amount of growth and reproduction on cutover lands and will soon follow with two other parties.

Mr. R. H. Campbell, Director Dominion Forestry Branch, recently inspected the plantations on drifting sands at Lachute, Quebec, and also the Government Nursery at Berthierville in company with Mr. G. C. Piche, Chief Forester.

Mr. J. H. Cunningham of the Laurentide Company, Ltd., has just completed a very complete and practical adaptation of the Dewey System of Decimal Classification to the needs of the Pulp and Paper industry.

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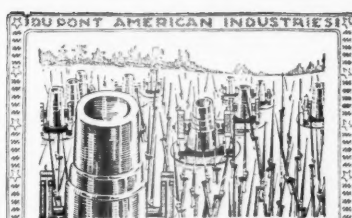
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Forest and Timber Engineer

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Ex-Pres., National Conservation Congress

Declaration of Principles and Policy of The American Forestry Association

IT IS A VOLUNTARY organization for the inculcation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watersheds; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people; that the census of 1913 shows our forests annually supply over one and a quarter billion dollars' worth of products; employ 735,000 people; pay \$367,000,000 in wages; cover 550,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions; that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon National and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

National and State Forests under Federal and State Ownership, administration and management respectively; adequate appropriations for their care and management; Federal co-operation with the States, especially in forest fire protection.

State Activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and its encouragement and extension, individually and by co-operation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose; and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid the lumberman in achieving this.

Cutting of Mature Timber where and as the domestic market demands it, except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal national and State appropriations for this work.

